TM 9-2320-328-13&P-1

TECHNICAL MANUAL

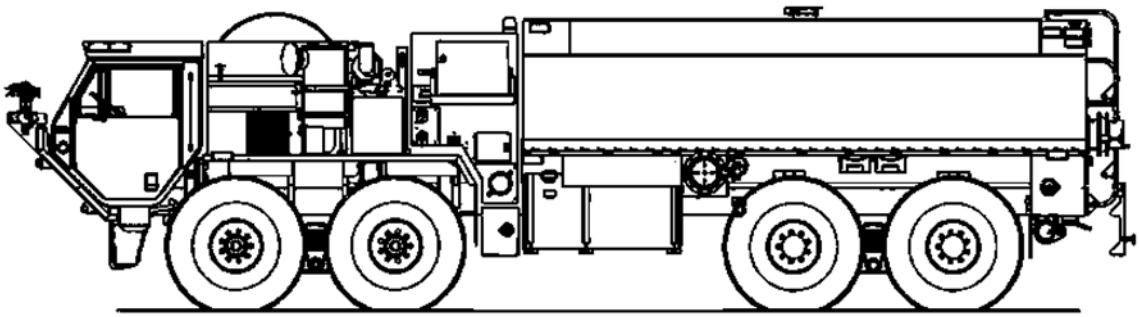
OPERATOR'S AND FIELD LEVEL
MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

FOR

HEMTT-BASED WATER TENDER (HEWATT)

MODEL M1158

NSN 2320-01-528-6294



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HEADQUARTERS, DEPARTMENT OF THE ARMY

APRIL 2008

WARNING SUMMARY

This list summarizes critical warnings in this technical manual. They are repeated here to let you know how important they are. Study these warnings carefully. They can save your life and the lives of personnel you work with. If there is any doubt about handling tools, materials, equipment, and procedures, see TB 43-0216, Safety and Hazard Warnings for Operation and Maintenance of TACOM Equipment.

FOR INFORMATION ON FIRST AID, REFER TO FM 4-25.11.

OPERATION HAZARDS

WARNING

- **CARBON MONOXIDE (EXHAUST GAS) CAN CAUSE DEATH**
- **Carbon monoxide is without color or smell, but can cause death. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no ventilation. Precautions must be followed to ensure crew safety when the personnel heater or engine of any vehicle is operated for any purpose.**
- **DO NOT operate personnel heater or engine of vehicle in a closed place without proper ventilation.**
- **DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment covers removed unless necessary for maintenance purposes.**
- **BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, IMMEDIATELY VENTILATE personnel compartments. If symptoms persist, remove affected crew to fresh air and keep warm. DO NOT PERMIT PHYSICAL EXERCISE. If necessary, give artificial respiration and get immediate medical attention. For artificial respiration, refer to FM 4-25.11.**
- **BE AWARE that the gas particulate filter unit or field protection mask for nuclear-biological-chemical protection WILL NOT offer safety from carbon monoxide poisoning.**
- **THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.**

WARNING

Personnel hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB or greater. Wear approved hearing protection devices when working in high noise level areas. Hearing loss occurs gradually, but becomes permanent over time.

WARNING

Diesel fuel compartment heaters come on automatically when truck engine is running and air temperature is below (+39°F [4°C]). CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU. Carbon monoxide is a colorless, odorless, DEADLY POISONOUS gas and when breathed, deprives body of oxygen and causes SUFFOCATION. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Permanent BRAIN DAMAGE or DEATH can result from severe exposure. Precautions MUST be followed to ensure personnel are safe whenever compartment heaters or engine are operated for any purpose. Injury to personnel may result.

WARNING

DO NOT operate compartment heaters or engine of truck in enclosed area without adequate ventilation. BE ALERT at all times whenever BATTERY switch is ON, truck engine is running, and air temperature is below (+39°F [4°C]) for exhaust symptoms. If either are present, IMMEDIATELY EVACUATE AND VENTILATE the area. Affected personnel treatment shall be: expose to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, give artificial respiration as described in FM 4-25.11 and get medical attention. BE AWARE; neither the gas particulate filter unit nor field protection mask for nuclear-biological-chemical protection will protect you from carbon monoxide poisoning. THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

MODIFICATION HAZARD

WARNING

Unauthorized modifications to, alterations to, or installations of this equipment are prohibited and are in violation of AR 750-10. Any unauthorized modifications, alterations, or installations could result in injury or death to personnel or damage to equipment.

HIGH-PRESSURE HYDRAULIC SYSTEM

WARNING

- **Hydraulic systems can cause serious injury if high-pressure lines or equipment fails.**
- **Never work on hydraulic systems or equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and can give first aid.**
- **Never disconnect any hydraulic hose or part while the engine is running. Allow several minutes to elapse after shutting off engine, to allow pressure to relieve itself, before attempting to remove hoses. Failure to comply may result in injury to personnel.**

ELECTRICAL SYSTEM

WARNING

- **Remove all jewelry, such as rings, dog tags, bracelets, etc. If jewelry or tools contact electrical circuits, a direct short may result. Damage to equipment or death to personnel may occur.**
- **Do not smoke, use open flame, make sparks or other ignition sources around batteries. A battery giving off gas could explode and cause injury to personnel.**

SOLVENT CLEANING COMPOUND

WARNING

Solvent cleaning compound MIL-PRF-680 Type II and III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion can cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage. Can be fatal if swallowed. Inhalation of high/massive concentrations can cause coma or be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. Failure to follow this warning may result in injury or death to personnel.

- **The flashpoint for Type II solvent cleaning compound is 141-198°F (61-92°C) and Type III is 200-241°F (93-116°C).**
- **Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.**
- **Fire extinguishers should be placed nearby when using solvent cleaning compound. Failure to follow this warning may result in injury or death.**
- **Cloths or rags saturated with solvent cleaning compound must be disposed of IAW authorized facilities' procedures. Failure to follow this warning may result in injury.**
- **Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particle may cause injury.**

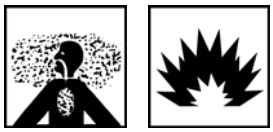
ADHESIVE

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from open fire and use in well-ventilated area. If adhesive, solvent, or sealing compound gets on skin or clothing, wash immediately with soap and water.

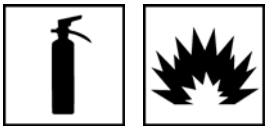
FLAMMABLE LIQUID AND COMBUSTIBLE VAPOR

WARNING



Gasoline, fuel oil, lubricating oil, grease, paint, paint thinner, cleaning solvents, and other combustible liquids present a serious fire hazard. Always store combustible liquids in approved containers and in their designated compartments or deck storage locations. Ensure exhaust and ventilation fans are operating while using cleaning solvents or paint products. Never store or charge batteries in a confined space without ventilation or near electrical equipment.

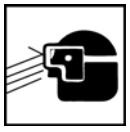
WARNING



Fuel is very flammable and can explode easily. To avoid serious injury or death, keep fuel away form open fire and keep fire extinguisher within easy reach when working with fuel. Do not work on fuel system when engine is hot. Fuel can be ignited by hot engine. While working with fuel, post signs that read NO SMOKING WITHIN 5O FEET OF VEHICLE.

PARTS UNDER PRESSURE

WARNING



Wear safety goggles and use caution when removing or installing springs, snap rings, retaining rings, and other parts under spring tension. These parts can act as projectiles, resulting in serious injury to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: Zero in the “Change No.” column indicates an original page or work package.

Date of issue for the original manual is:

Original . . . . . 30 April 2008

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 APRIL 2008

TECHNICAL MANUAL

OPERATOR'S AND FIELD LEVEL MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

FOR

HEMTT-BASED WATER TENDER (HEWATT)

MODEL M1158

NSN 2320-01-528-6294

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS
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HOW TO USE THIS TECHNICAL MANUAL

This manual is designed to help operate and maintain the HEMTT-Based Water Tender (HEWATT). This technical manual should be used in conjunction with the TM 9-2320-279-10 and TM 9-2320-315-14&P series manuals. Listed below are some of the features included in this manual to help locate and use the needed information:

- Warnings, cautions, subject headings, and other essential information are printed in bold type, making them easier to see.
- In addition to text, there are illustrations showing how to take a component off and put it back on. Cleaning and inspection criteria are also included where necessary.

This manual is subdivided into three volumes containing the following:

Volume 1

- Chapter 1 of this manual supplements the TM 9-2320-279-10 manual and it describes the HEWATT specific components. Equipment data is also provided.
- Chapter 2 of this manual supplements the TM 9-2320-279-10 manual and provides HEWATT Operating Instructions.
- Chapter 3 of this manual supplements the TM 9-2320-315-14&P manual and provides HEWATT Operator and Field Level Troubleshooting Procedures.
- Chapter 4 of this manual supplements the TM 9-2320-315-14&P manual and provides HEWATT Preventive Maintenance Checks and Services (PMCS) and Lubrication Instructions.

Volume 2

- Chapter 5 of this manual supplements the TM 9-2320-315-14&P manual and provides Field Level Maintenance Instructions for the HEWATT. An Illustrated List of Manufactured Items and Torque Limits are provided at the rear of this chapter.

Volume 3

- Chapter 6 of this manual supplements the TM 9-2320-315-14&P manual and provides Repair Parts and Special Tools List (RPSTL) for the HEWATT.
- Chapter 7 of this manual supplements the TM 9-2320-315-14&P manual and provides References, Two-Level Maintenance Allocation Chart (MAC), Components of End Item (COEI) and Basic Issue Items (BII) Lists, Expendable and Durable Items List, an Alphabetical Index, and Schematic Foldouts for the HEWATT electrical, hydraulic, and pneumatic systems.

The vehicles referenced in the TM 9-2320-279-10 and TM 9-2320-315-14&P manuals are similar, but not identical to the vehicle referenced in the supplemental manual. HEWATT vehicle procedures that are common to the M985 can be found in the TM 9-2320-279-10 or TM 9-2320-315-14&P manual. Configuration differences can be determined by visually inspecting the vehicle prior to maintenance.

Follow these guidelines when using the manual:

- Read all WARNINGS and CAUTIONS before performing any procedure.
- The operator must read this technical manual along with TM 9-2320-279-10 manual and become familiar with the content of each manual before attempting to operate the vehicle.
- Maintenance personnel must read this technical manual along with TM 9-2320-315-14&P manual and become familiar with the content of each manual before performing any maintenance to the vehicle.

CHAPTER 1

GENERAL INFORMATION AND DATA

OPERATOR MAINTENANCE

GENERAL INFORMATION

SCOPE

a. Type of Manual.

This manual is used for operation, troubleshooting, and operator-performed maintenance on the HEMTT-Based Water Tender (HEWATT). The HEWATT is built on a Heavy Expanded Mobility Tactical Truck (HEMTT) M985 Chassis.

b. Model/Name.

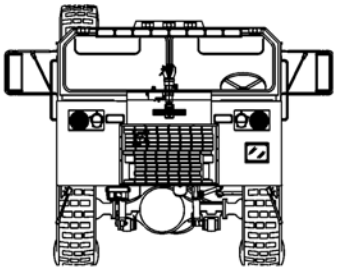
M1158 HEMTT-Based Water Tender (HEWATT).

c. Purpose of Equipment.

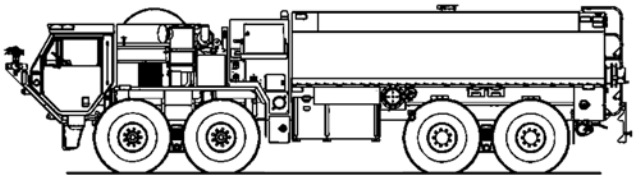
The HEWATT has a 66,000 lb. (29,964 kg) GVWR. The HEWATT is equipped with equipment necessary to extinguish brush, wildland, and structural fires at isolated military installations and to support Tactical Fire Fighting Truck (TFFT) operations.

The HEWATT is not designed to tow a trailer.

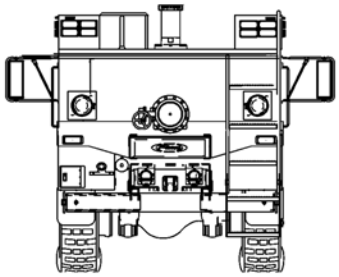
The HEWATT is equipped with a bumper turret, four under truck nozzles, a driver side and passenger side discharge, a one-inch diameter hose on a mechanical/electrical hose reel, a Class A foam system, a water system, a 2500 gallon portable water reservoir, a pump operator's panel, a cab instrument panel, driver side and passenger side auxiliary inlets, main inlet, and direct tank fill inlet.



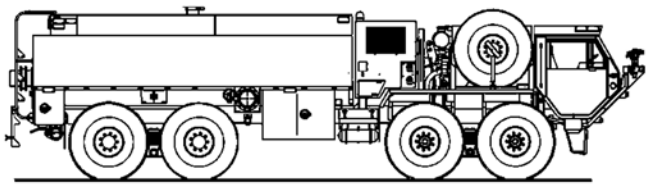
FRONT VIEW



LEFT SIDE VIEW



BACK VIEW



RIGHT SIDE VIEW

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-001 series contains valuable field information on equipment covered in this manual. Information in the TB 43-001 series is compiled from some of the Equipment Improvement Reports prepared on vehicles covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that were submitted to the EIR program. The TB 43-001 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWOs), warranties (if applicable), actions taken on some of the DA form 2028s (Recommended Changes to Publications). Refer to TM 43-001 series periodically for the most current and authoritative information on the equipment. The information will help to do a better job and will advise of the latest changes to this manual. Also refer to DA Pam 25-30, Consolidated Index of Army Publications and Blank Forms, and WP 0397, References, of this manual.

CORROSION PREVENTION AND CONTROL

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern, particularly since the HEWATT usually operates in a wet environment. It is important that any corrosion problems be reported so they can be corrected and improvements can be made to prevent problems in the future.

While corrosion is typically associated with the rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it should be reported to your supervisor.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-6, Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use.

DEMOLITION BY MECHANICAL MEANS

Use hammers, crowbars, picks, or other tools which may be valuable to destroy the engine block, manifold, water pump, and electrical controls.

DEMOLITION BY MISUSE

Perform the following steps to render the HEWATT vehicle inoperative.

- Drain radiator and crankcase. Place sand, nuts, bolts or broken glass into radiator opening, oil fill tube, and fuel tank.
- Disconnect radiator fan and run engine at full throttle.

WARRANTY INFORMATION

Pierce Manufacturing Inc. warrants each piece of new fire or rescue apparatus to be free from defects in materials or workmanship under normal use and service for a period of thirteen (13) months from the date of shipment. Our obligation under this warranty is limited to repairing or replacing, as the company may elect, any defective part or parts free of charge to the original purchaser. Pierce Manufacturing reserves the right to request and examine defective parts.

This warranty will not apply to:

1. Normal maintenance and adjustments.
2. Any vehicle which; has been repaired or altered outside of our factory in any way to affect the stability; has been subject to misuse, neglect, or accident; or loaded beyond the factory rated load capacity.
3. Commercial chassis and associated equipment furnished with the chassis, signaling devices, generators, batteries, or other trade accessories in which they are usually warranted separately by their respective manufacturers.

This warranty is in lieu of all other warranties, expressed or implied, all other representations to the original purchaser and all other obligations or liabilities, including liability for incidental or consequential damages on the part of the company. Pierce Manufacturing Inc. neither assumes or authorizes any other person to give or assume any other warranty or liability on the company's behalf unless made or assumed in writing by the company.

Pierce manufacturing Inc. follows ASTM D 6210 and ASTM D 6211 in regard to coolant specification on this equipment. Use of ASTM D 6210 or ASTM D 6211 compliant coolant and a fully formulated coolant mix, meaning with proper SCA (supplemental coolant additive) blending is **required** during the warranty period. Failure to follow the OEM specification for a fully formulated and compliant coolant during the warranty period will affect the engine warranty on this vehicle. See TB 750-651 (para 2).

Questions concerning the HEWATT warranty can be submitted to Pierce Manufacturing Inc. via e-mail at contactcenter@piercemfg.com or by calling 1-888-YPIERCE (1-888-974-3723).

NOMENCLATURE CROSS-REFERENCE LIST

Common Name	Official Nomenclature
cable	wire rope
foam concentrate	foam agent
Fol-da-tank	portable water tank

LIST OF ABBREVIATIONS/ACRONYMS

amp. . . . . amperage
C . . . . . Celsius
CAGE . . . . . Commercial and Government Entity
cm. . . . . centimeters
CPC . . . . . Corrosion Prevention and Control
dB . . . . . decibel
ECM . . . . . Electronic Control Module
F . . . . . Fahrenheit
ft.. . . . . feet
gal. . . . . gallon(s)
GPM . . . . . Gallons per Minute
GVWR . . . . . Gross Vehicle Weight Rating
HEMTT . . . . . Heavy Expanded Mobility Tactical Truck
HEWATT. . . . . HEMTT-Based Water Tender
HP. . . . . Horsepower
in. . . . . inch
kg . . . . . kilogram
kPa . . . . . kilo pascal
kW . . . . . kilowatt
l. . . . . liter
lb. . . . . pound(s)
l/min. . . . . liters per Minute
m. . . . . meter(s)
mm . . . . . millimeter
MOPP. . . . . Mission Oriented Protective Posture
NFPA . . . . . National Fire Protection Association
NPSM . . . . . National Pipe Straight Mechanical
ORS . . . . . O-Ring Seal
PMCS . . . . . Preventative Maintenance Checks and Services
psi . . . . . pounds per square inch
PTO . . . . . Power Take Off
PTT. . . . . Push To Talk
rpm . . . . . revolutions per minute
SCBA . . . . . Self-Contained Breathing Apparatus
SINCGARS. . . . . Single Channel Ground and Airborne Radio System
TFFT. . . . . Tactical Fire Fighting Truck
VAC . . . . . Voltage Alternating Current
VDC . . . . . Voltage Direct Current
V . . . . . Volt(s)
W . . . . . Watt(s)
WP . . . . . Work Package

LIST OF WARNING ICONS/DESCRIPTIONS

EAR PROTECTION - headphones over ears shows that noise level will harm ears.

ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.

ELECTRICAL - electrical wire to hand with electricity symbol running through hands shows that shock hazard is present.

FALLING PARTS - arrow bouncing off human shoulder and head shows that falling parts present a danger to life or limb

FLYING PARTICLES - arrows bouncing off face shows that particles flying through the air will harm face.

HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique.

HEAVY PARTS - hand with heavy object on top shows that heavy parts can crush and harm.

HEAVY PARTS - foot with heavy object on top shows that heavy parts can crush and harm.

HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.

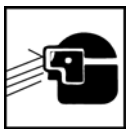
HEAVY PARTS - heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.

HOT AREA - hand over object radiating heat shows that part is hot and can burn.

MOVING PARTS - human figure with an arm caught between gears shows that the moving parts of the equipment present a danger to life or limb.

SLICK FLOOR - wavy line on floor with legs prone shows that slick floor presents a danger for falling.

EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.



EYE PROTECTION - person with goggles shows that the material will injure the eyes.

FIRE - flame shows that a material may ignite and cause burns.

VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

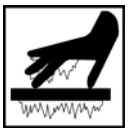
FIRE EXTINGUISHER - shows that material may ignite and a fire extinguisher should be in easy reach.

STAY CLEAR OF VEHICLE - person run over by vehicle shows that moving vehicle presents a danger to life and limb.

SKIN IRRITATION - a hand radiating shows that material can cause skin irritation.

TIRE BLOWOUT - tire with hole shows that over or under inflated tire may rupture, presenting a danger to life or limb.

WHIPPING HOSE - whipping hose hitting personnel shows that air or hydraulic hoses removed while under pressure present a danger to life and limb.



COLD AREA - hand over object with ice hanging shows that part is extremely cold to touch.

WARNING/CAUTION - shows that a **WARNING** or **CAUTION** is present, and extra safety measures should be taken.

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this technical manual. If quality of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

REPAIR PARTS

Repair parts are listed and illustrated in WP 0389 of this technical manual.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

a. Equipment Characteristics.

The HEWATT has a 66,000 lb. (29,964 kg) GVWR when fully loaded with firefighting agents, equipment and two (2) fully equipped crew members. The HEWATT is equipped with equipment necessary to extinguish brush, wildland, and structural fires at isolated military installations and to support TFFT (Tactical Fire Fighting Truck) operations.

The M1158 is built on a modified M985 chassis. The modifications made to the M985 chassis are:

1. A mounting bracket has been added on the front of the cab for bumper turret.
2. Personnel cab roof has been modified to accept lightbars.
3. Rear springs have been updated for 66,000 lbs. (29,964 kg) GVWR, refer to M985 suspension.
4. Air compressor and power steering unit have been swapped to allow room for PTO drive system.
5. Fuel tank has been lowered for water tank mounting.
6. Cab steps were increased in size to allow for safer cab access.
7. Driver side air supply port has been relocated left of pump operator’s panel.

b. Capabilities.

1. The HEWATT is equipped with equipment necessary to extinguish brush, wildland, and structural fires at isolated military installations and to support TFFT operations.
2. The HEWATT is capable of operating in temperatures from -25°F to 120°F (-32°C to 49°C).

c. Features.

1. A water pump/foam system control panel is located inside the personnel cab, which provides the following controls: Tank-to-pump, pump primer, pump cooler, foam system, under truck nozzles, windshield deluge, foam level gauge, water level gauge, radio controls, deck lighting, scene lighting, emergency warning lighting controls, and water pump control system with master gauges.
2. A pump operator’s panel is located outside the cab on the driver side of the vehicle and provides the following controls: Tank-to-pump, pump cooler, foam system, panel lights, foam flush, pump primer, direct tank fill, hose reel, tank drain, tank fill/re-circulating line valve, drive side auxiliary inlet valve, drive side auxiliary discharge valve, passenger side auxiliary inlet valve, passenger side auxiliary discharge valve, foam level gauge, water tank gauge, thermal relief indicator water pump control system with master gauges, and radio headset jack.
3. A 24-VDC electric system is provided to power the firefighting system.
4. A winterization package is provided to allow operation of pump and foam system in temperature down to -25°F (-32°C).

5. One 4 in. (10.2 cm) direct tank water tank fill is provided. The inlet is piped directly from water tank to an external location on the rear of the vehicle. An electric over-air-valve controls the inlet.

6. A bumper turret is piped to the front bumper of the personnel cab. The turret has a horizontal rotation of 180 degrees and operates from 45 degrees above to 20 degrees below horizontal. Horizontal rotation and automatic oscillation are driven by a 24-VDC direct drive motor/actuator. Plumbing consists of 2 in. (5 cm) piping and flexible hose with a constant flow 250 GPM (946 l/min) nozzle.

7. Turret is remote controlled from a control box located in the center of the personnel cab. A joystick is provided for water on/off, monitor left/right, monitor up/down, and a straight or fog pattern.

8. Four (4) under truck nozzles located below the vehicle are capable of 1% Class A foam and are controlled inside the personnel cab.

9. The standard two person HEMTT personnel cab has been retained. The standard HEMTT passenger side seat has been replaced with officer's seat equipped with a Self-Contained Breathing Apparatus (SCBA) seat back.

10. Personnel cab access doors open to 90 degrees from closed position to allow safe and fast access for crewman in full MOPP gear.

11. A 2,500 gallon (9,463 l) portable water tank is provided for extra off truck water capacity.

12. The vehicle is equipped with a set of two, two-way, FM handheld, 5 W, 150 to 174 MHz radios, and one cab mounted two-way, VHF, 40 Watt, 128 channel base radio. The Net base is installed and operational in personnel cab, with all electrical supply and antenna provisions. The radio set is water and heat resistant with programmable channel selection. Each handheld radio is provided with a base recharging unit, which maintains battery charge.

13. Two hundred feet (61 m) of 1 in. (2.54 cm) hose is provided on a 24 VDC hose reel with a manual unwind and electrical or manual rewind, located in pump house on driver side of the vehicle.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

1. **Personnel Cab:** Used to transport crew, and house vehicle control, firefighting controls, gauges, and indicators for firefighting operations.

2. **Equipment Body:** Used to carry all BII, COEI, AAL, and repair parts.

3. **Pump Operator's Panel:** Used by crew to control firefighting apparatus from driver side of outside vehicle.

4. **Water Tank:** Stows 2,500 gallons (9,463 l) of water used by system.

5. **Foam Tank:** Stows 50 gallons (189 l) of foam agent used for Class A foam based fires.

6. **Rear Access Ladder:** Used by crew to access hose, hatch compartments, foam fill access, and tank fill from top of HEWATT equipment body.

7. **Stowage Compartments:** Eleven (11) stowage compartments used to stow COEI and BII.

8. **Warning Lights:** Used to indicate fire situation.

9. **Bumper Turret:** Located on front bumper, used to extinguish fires. Turret is operated using controls in personnel cab.

10. **Side Discharge(s):** Used to extinguish fires, two (2) 2.5 in. (6 cm) side discharge(s), one (1) on each side.

11. **Auxiliary Water Inlet(s):** Used to supply water to system or fill water tank, two (2) 2.5 in. (6 cm) auxiliary water inlets, one (1) on each side.

12. **Under Truck Nozzles:** Four (4) under truck nozzles located below the vehicle are capable of 1% class A foam. Under truck nozzles are operated using controls in personnel cab.

13. **Portable Water Tank:** Located on rear of vehicle is a 2,500 gallon (9463 l) portable auxiliary water storage system.

14. **Pump House:** Enclosure for PTO driven hydraulic pump, hydraulic motor, water pump and system valves.

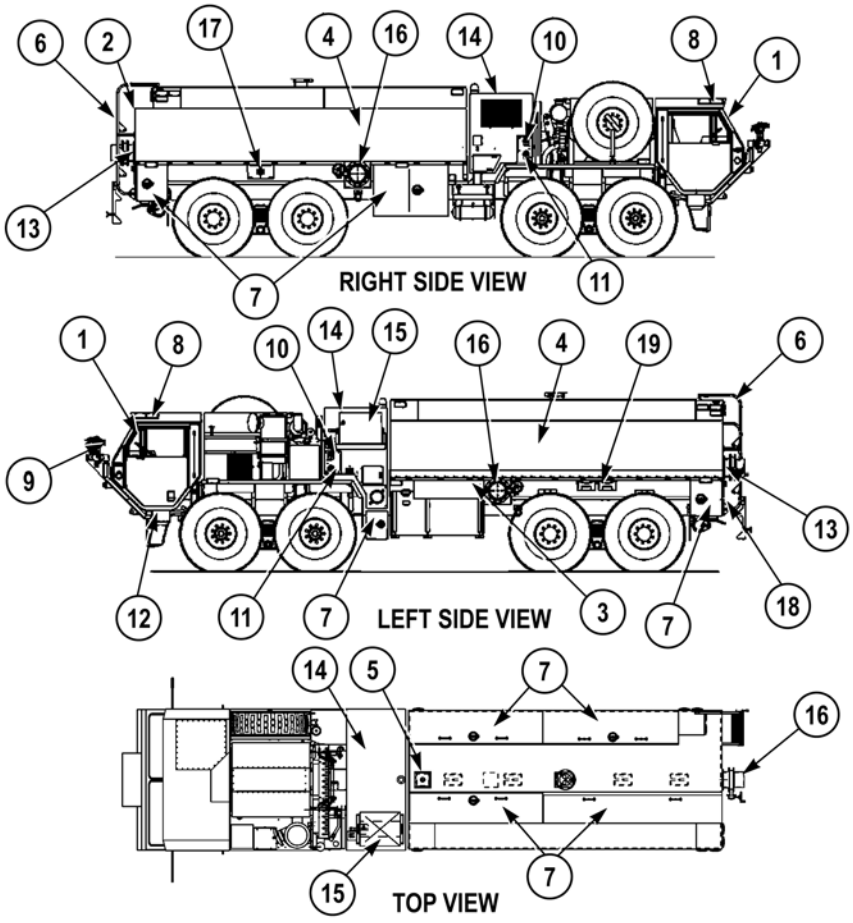
15. **Hose Reel:** Located inside driver side of pump house is capable of holding 200 ft. (61 m) of 1 in. (2.54 cm) diameter hose.

16. **Water Tank Dump Valve:** Three manually operated water tank dump valves.

17. **SCBA Air Tanks:** Two SCBA air tank stowage compartments.

18. **Water Tank Direct Fill Inlet:** Water tank direct fill inlet.

19. **Wheel Chocks:** Two wheel chock stowage compartments.



EQUIPMENT DATA

Refer to Table 1 for HEWATT M1158 equipment data. Refer to TM 9-2320-279-10 for all equipment data not specified below.

Table 1. Equipment Data.

Model	Item			
HEWATT M1158	**VEHICLE DIMENSIONS** **Width (overall):** 96 in. (243.8 cm) **Height (overall):** 114.25 in. (290.2 cm) **Height (reduced for shipping):** 113 in. (287 cm) **Length (overall):** 420 in. (1,066.8 cm) **Wheelbase:** 191 in. (485 cm) **Turning Circle (wall-to-wall):** 100 ft. (30.5 m) **Ground Clearance:** 20 in. (51 cm) except 13 in. (33 cm) under center of axles **Center of Gravity (at curb weight):** 59 in. (149.9 cm) above ground, 85 in. (215.9 cm) behind center of front axles (EST.)			
HEWATT M1158	**WEIGHT** **Curb Weight:** 42,000 lb. (19,068 kg) **Gross Vehicle Weight Rating:** 66,000 lb. (29,964 kg)			
HEWATT M1158	**VEHICLE PERFORMANCE** **Maximum Side Slope:** 54.5 percent **Maximum Ford Depth:** 36 in. (91 cm) **Maximum Grade at GCWR:** 60 percent **Approach Angle:** 43 degrees **Departure Angle:** 45 degrees			
HEWATT M1158	**TIRE PRESSURES**			
Front	**Highway Cross**	**Country-Dry**	**Cross Country-Wet**	**Sandy Terrain**
Standard or XZL Tire	60 psi (414 kPa)	35 psi (241 kPa)	20 psi (138 kPa)	30 psi (207 kPa)
Sand Tire	60 psi (414 kPa)	N/A	N/A	25 psi (207 kPa)
Rear				
Standard or XZL Tire	70 psi (483 kPa)	40 psi (276 kPa)	30 psi (207 kPa)	35 psi (241 kPa)
Sand Tire	70 psi (483 kPa)	N/A	N/A	30 psi (207 kPa)

Table 1. Equipment Data. (Continued)

Model	Item
HEWATT M1158	**CAPACITIES** **Hydraulic Reservoir w/Filters (Pump Hydraulics):** 11 gal. (41.6 l) **Hydraulic Pump Gear Case:** 10 fl./oz. (0.29 l) **Water Tank (HEWATT):** 2,500 gal. (9,463 l) **Portable Water Tank:** 2,500 gal. (9,463 l) **Foam Tank:** 50 gal. (189.3 l) **Pump Priming Tank:** 1.5 qt. **Water Pump Gear Case:** 1 qt. (0.9 h)
HEWATT M1158	**WATER PUMP** **Make:** Darley **Model:** HH500 **Type:** Single Stage, Centrifugal, Hydraulic PTO Powered Drive Package, Mechanical Seals **Flow Rate:** 500 GPM (1892.7 l/min) at 150 psi (1034.2 kPa).
HEWATT M1158	**WATER DISCHARGE CAPABILITIES** **Bumper Turret:** 250 GPM (946 l/min) at 190 psi (1,310 kPa) **Side Discharges:** 250 GPM (946 l/min) at 150 psi (1,034 kPa) **Hose Reel:** 60 GPM (227.1 l/min) at 190 psi (1,310 kPa) **Under Truck Nozzles:** Four times 17 GPM (64.4 l/min) at 190 psi (1,310 kPa)
HEWATT M1158	**FOAM SYSTEM DISCHARGE CAPABILITIES** **Class A Foam System:** 500 GPM (1893 l/min) at 1.0% (Under Truck Nozzles) 500 GPM (1893 l/min) at 0.5% (Bumper Turret)
HEWATT M1158	**WATER PUMP DISCHARGE PRESSURE** **100% of Rated Capacity:** 150 psi (1,034 kPa) net pump pressure **70% of Rated Capacity:** 200 psi (1,379 kPa) net pump pressure **50% of Rated Capacity:** 250 psi (1,724 kPa) net pump pressure
HEWATT M1158	**ELECTRICAL SYSTEM** **Voltage:** 24 **Alternator (amps):** 130 **RFI Suppression Ability:** Yes

END OF WORK PACKAGE

OPERATOR MAINTENANCE

THEORY OF OPERATION

SYSTEM INTRODUCTION

The HEWATT contains the same functional base systems as the M985 vehicles, with some modifications. The HEWATT firefighting systems are described in the following paragraphs. Refer to TM 9-2320-279-10 for base M985 vehicle systems not contained in this manual.

WATER PUMPING SYSTEM

The water pumping system for the HEWATT is based on a single stage, hydraulic driven centrifugal water pump, which is controlled by a pressure governor. The hydraulic power for the water pump is provided by an engine PTO driven hydrostatic pump.

The bumper turret and under truck nozzles are operated from the cab instrument control panel, and the side discharges and hose reel are operated from the pump operator's control panel. The controls are interlocked to ensure single control operation.

In pump and roll/drive mode, water is supplied to the pump from the onboard water tank. In stationary mode, water is supplied to the pump from either the onboard water tank or alternate source(s). Alternate sources include fire hydrants, remote pumping units, or drafting from open reservoirs. If water is supplied from the onboard water tank during stationary firefighting, the water tank can be continuously refilled using the automatic tank fill valve. This system maintains the water level in the water tank automatically by opening the direct fill valve when the water level in tank falls below a certain predetermined level, and closing the direct fill valve when the water tank is full.

PRESSURE GOVERNOR

The pressure governor is designed to control and maintain the water pump output pressure at a selector (manual operations) or predetermined (automatic operations) value.

FOAM SYSTEM

The HEWATT's foam system uses an around-the-pump foam system to deliver class A foam agent to the discharge valves during firefighting missions. This system uses an eductor in line with the pump discharge and intake manifolds, to draw foam agent from an onboard tank into the water stream during foam system operations. Metering valves are placed in line with the eductor to control foam agent injection percentage for bumper turret and under truck nozzles operations. Each metering valve has an orifice sized to inject foam at a preset rate for a pre-determined flow, which is 0.5% for bumper turret operations, and 1.0% for under truck nozzles operations. When a discharge valve is opened, a signal is sent to the respective metering valve to open the corresponding port. The foam agent is then mixed with the water and is pumped to the corresponding discharge valve by the water pump. It is important to note that the bumper turret and under truck nozzles must be operated at the same flow every time in order for foam system to function correctly.

A manual metering valve is also provided so class A foam can be delivered during side discharge and hose reel operations. This valve is operated by pump operator when adjustments to percentage and flow rate are required. The manual metering valve must be adjusted whenever the flow is changed during operations.

NOTE

- Foam system will not operate properly with intake pressures higher than 5 psi (34 kPa). To facilitate operations from either a fire hydrant or from relay pumping, the automatic tank refill should be used. This system allows continuous pumping from onboard water tank with accurate water/foam concentration levels.
- The foam system can be operated from the cab for bumper turret and under truck nozzles operations, and the pump operator's panel for side discharge, hose reel, and flushing operations.

WINDSHIELD DELUGE SYSTEM

The windshield deluge system supplies water to the nozzles mounted below the windshield, to clean the windshield during firefighting missions. The water is drawn from the onboard water tank by a 24 VDC electric pump. The windshield deluge system is operated from cab instrument panel.

ELECTRICAL SYSTEM

The HEWATT's electrical system is powered by 12 and 24 VDC circuits. 12 VDC powers the radios and battery charger circuits, and 24 VDC powers the valve control, emergency lighting, and scene (work) light pressure governor circuits. Power for these systems is provided by the HEMTT chassis batteries.

AIR SYSTEM

The HEWATT's air system provides air pressure for valve control. The air pressure for this system is provided by the HEMTT chassis air system. The HEMTT chassis air system is protected by an 85 psi (586 kPa) pressure protection valve. System air pressure must be above 85 psi (586 kPa) for valve operations.

WINTERIZATION PACKAGE

A winterization package is provided, to allow operation of the water pump and foam systems in temperatures down to -25°F (-32°C). The package uses a diesel-fired 27,300 BTU heater to heat the pump house, when the ambient temperature in the pump house is below 39°F (4°C). Note, the HEWATT vehicle should be stored in a controlled environment with an ambient temperature above 55°F (13°C) when the water and foam tanks are filled and prior to any cold weather firefighting missions.

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS

OPERATOR MAINTENANCE

DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

CONTROLS AND INDICATORS INTRODUCTION

This section shows the location and describes the use of controls and indicators used to operate the unique systems of the HEWATT.

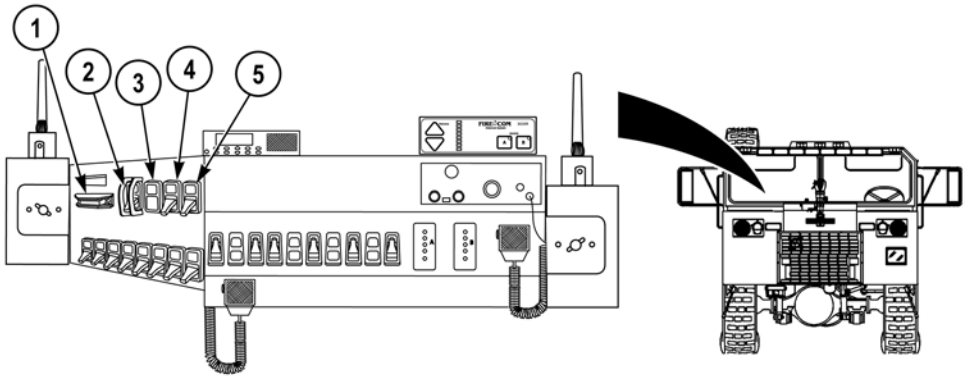


Figure 1. Cab Instrument Panel - Upper Left.

Key Fig. 1	Control or Indicator	Function
1	CHECK FOR OPEN COMPARTMENT DOORS WHEN LIGHT IS ON Indicator Light	Indicator light illuminates whenever a compartment door is open.
2	PUMP PTO Switch	Push up to engage pump PTO. Push down to disengage pump PTO.
3	PUMP PTO ENGAGED Indicator Light	Indicator light will illuminate when pump PTO is engaged.
4	STEP LIGHTS Switch	Push up to turn on step light. Push down to turn off step light.
5	REAR SCENE Light Switch	Push up to turn on rear scene light. Push down to turn off rear scene light.

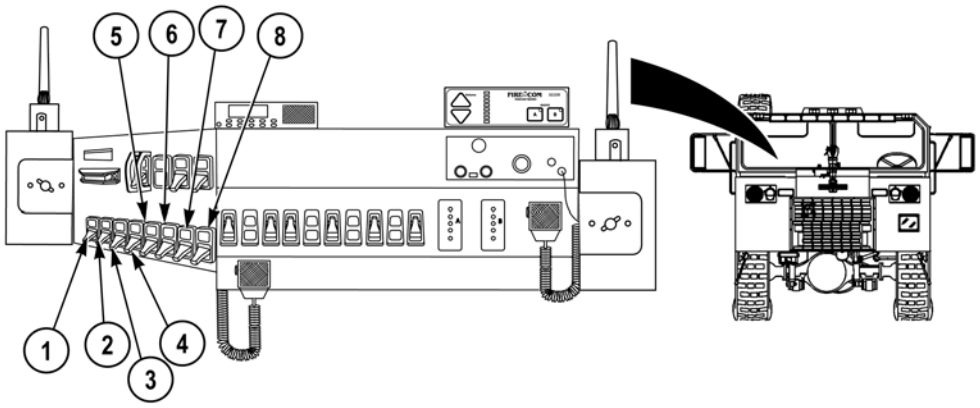


Figure 2. Cab Instrument Panel - Lower Left.

Key Fig. 2	Control or Indicator	Function
1	EMERG MASTER Light Switch	Allows operator to turn all emergency lights on, when individual emergency light switches are in on position. Push up to turn on emergency lights. Push down to turn off emergency lights.
2	ROOF EMERGENCY LIGHTS Switch	Push up to turn on roof emergency lights. Push down to turn off roof emergency lights.
3	F/R LOWER WARNING Light Switch	Push up to turn on front and rear lower warning lights. Push down to turn off front and rear lower warning lights.
4	SIDE WARNING Light Switch	Push up to turn on side warning lights. Push down to turn off side warning lights.
5	UPPER REAR WARNING Light Switch	Push up to turn on upper rear warning lights. Push down to turn off upper rear warning lights.
6	OVERHEAD WARNING Light Switch	Push up to turn on overhead warning lights. Push down to turn off overhead warning lights.
7	DRIVER SCENE Light Switch	Push up to turn on driver scene light. Push down to turn off driver scene light.
8	PASS SCENE Light Switch	Push up to turn on passenger scene light. Push down to turn off passenger scene light.

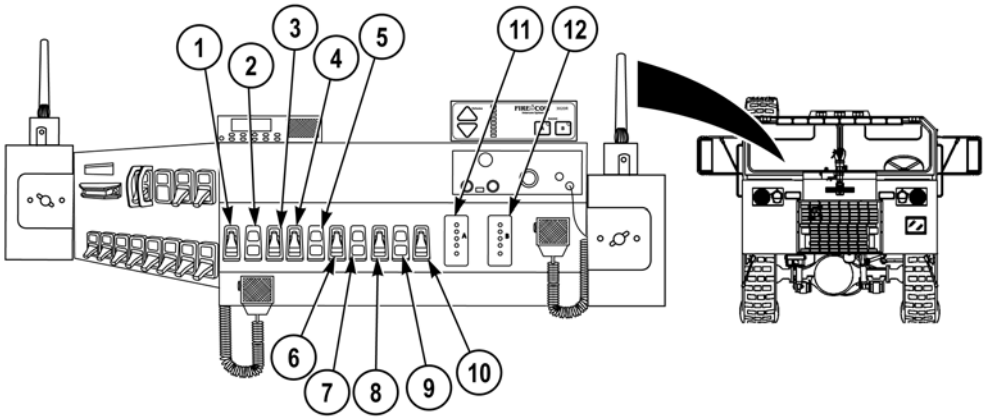


Figure 3. Cab Instrument Panel - Lower Right.

Key Fig. 3	Control or Indicator	Function
1	TANK TO PUMP Switch	Push up to open tank discharge valve. Push down to close tank discharge valve.
2	TANK TO PUMP Indicator Light	Illuminates when tank discharge valve is open.
3	PUMP PRIMER Switch	Push up to activate priming valve and operate electric pump primer.
4	PUMP COOLER Switch	Push up to open pump cooler valve and activate pump cooler system. Push down to close valve.
5	PUMP COOLER Indicator Light	Illuminates when pump cooler valve is open.
6	FOAM SYSTEM Switch	Push up to open foam valve and discharge foam into water line. Push down to close foam valve.
7	FOAM SYSTEM Indicator Light	Illuminates when foam valve is open.
8	UNDER TRUCK NOZZLES Switch	Push up to open under truck valve and discharge water through under truck nozzles. Push down to close under truck nozzles valve.
9	UNDER TRUCK NOZZLES Indicator Light	Indicator light illuminates when under truck nozzles valve is open.
10	WINDSHIELD DELUGE Switch	Push up to open windshield deluge valve and discharge water to windshield deluge. Push down to close windshield deluge valve.
11	FOAM LEVEL Gauge	Monitors level of foam in foam tank.
12	WATER LEVEL Gauge	Monitors level of water in water tank.

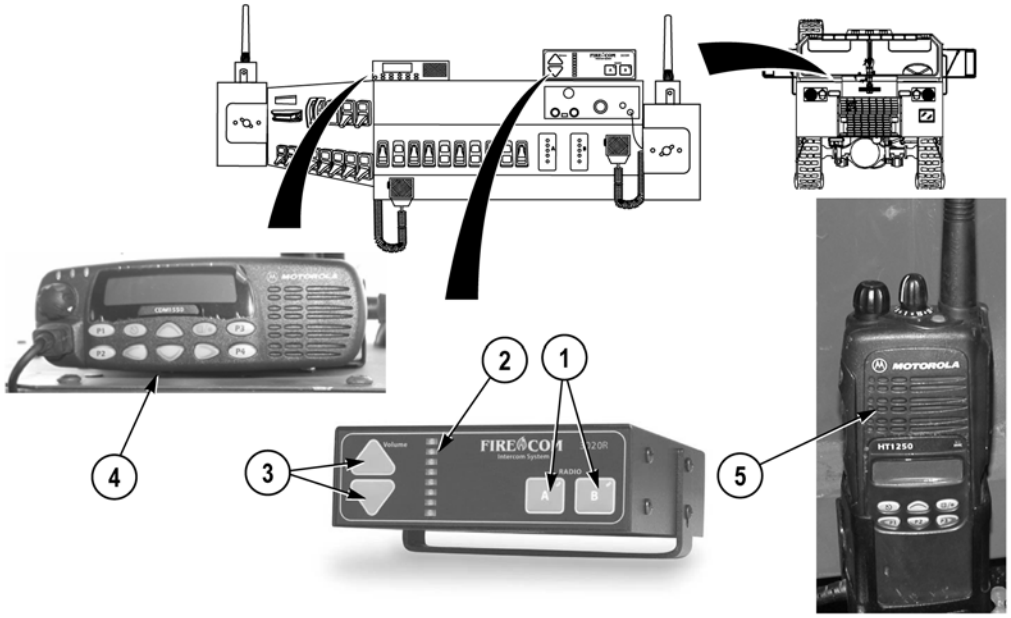


Figure 4. Cab Instrument Panel - Upper Right/Radio.

Key Fig. 4	Control or Indicator	Function
1	Transmit Select/Receive Select	Used to select between RADIO A, RADIO B, or both.
2	LED Display	Shows volume level when sending or receiving communications.
3	Intercom Volume	Adjusts intercom volume level.
4	Mobile Radio	Base unit used to communicate with other radios.
5	Handheld Radio	Portable unit used to communicate with other radios.

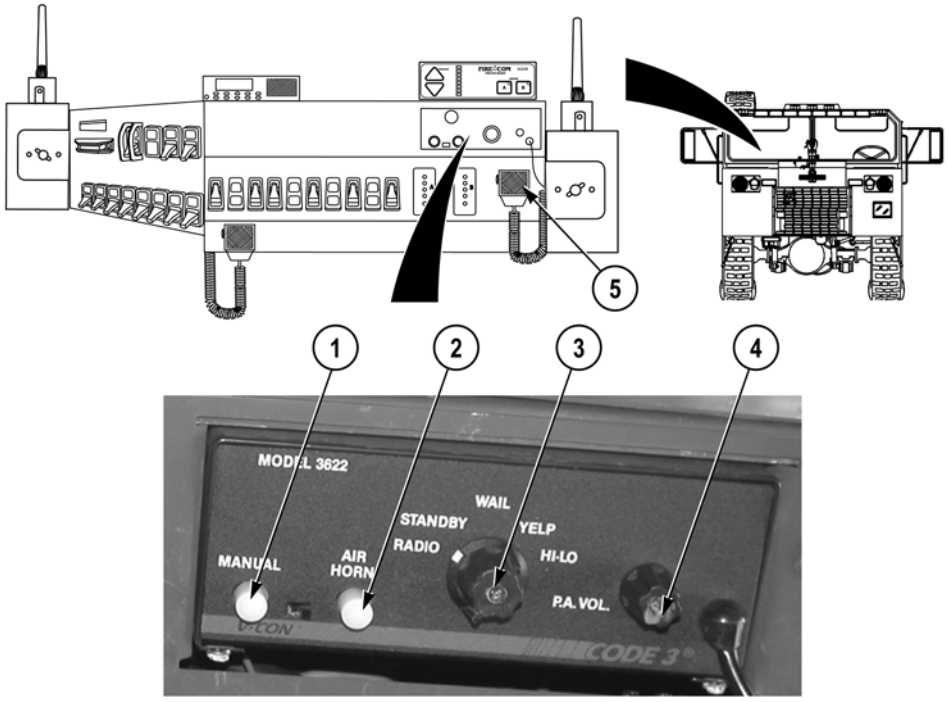


Figure 5. Cab Instrument Panel - Upper Right/Electronic Siren Controls.

Key Fig. 5	Control or Indicator	Function
1	MANUAL Operation Switch	**NOTE** HIT & GO feature produces audio sounds for approximately 5 seconds. Push button switch has no effect when selector switch is in RADIO. Produces wail sound when selector switch is in STANDBY. Produces yelp sound when selector switch is in WAIL. Has no effect when selector switch is in YELP. Produces yelp sound when selector switch is in HI-LO.
2	AIR HORN Switch	Produces air horn sound in all selector switch positions except RADIO.
3	MODE Switch	Used to switch between modes of operation. Possible selections are RADIO, STANDBY, WAIL, YELP, and HI-LO.
4	P.A. VOL. Switch	Used to adjust level of P.A. audio volume.
5	Push-To-Talk (PTT) Microphone	Used to communicate with other radios. Push button to talk. Release button to listen.

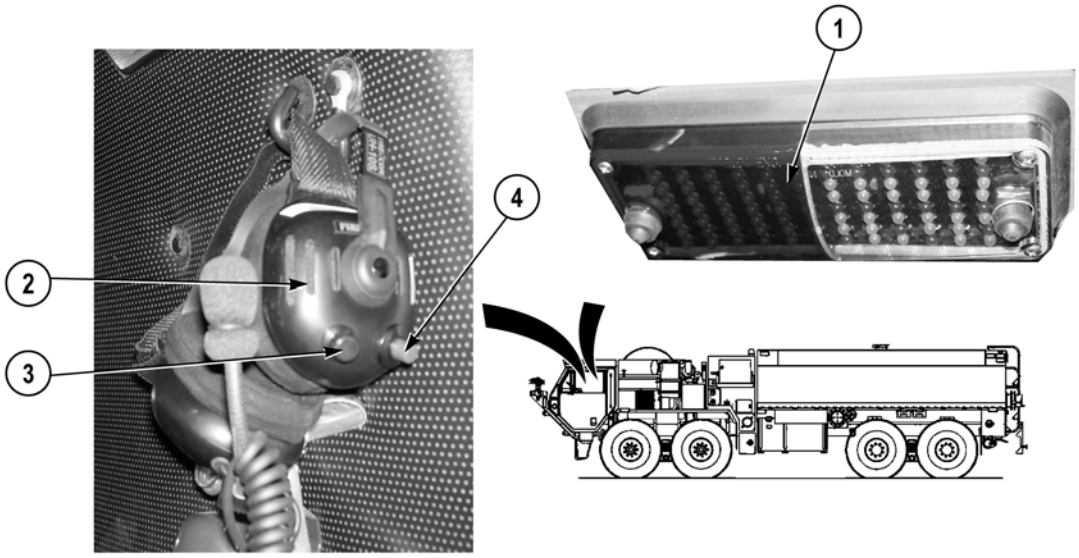


Figure 6. Personnel Cab.

Key Fig. 6	Control or Indicator	Function
1	Cab Dome Lights	Push button to turn on cab dome light. Push button again to turn off cab dome light.
2	Radio Headset	Radio headset unit used to communicate with other radios.
3	Volume Control	Used to adjust radio headset volume.
4	Push-To-Talk (PTT) Button	Used to communicate with other radios. Push button to talk. Release button to listen.

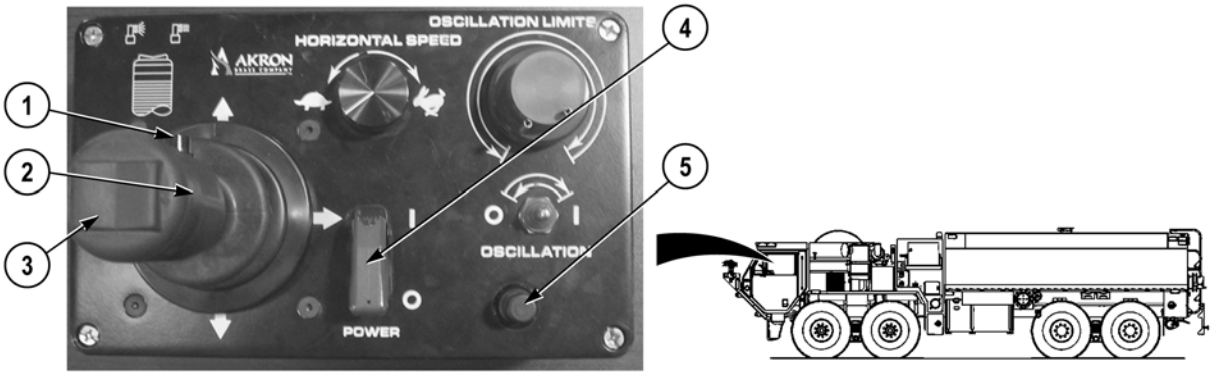


Figure 7. Bumper Turret Controls (Sheet 1 of 2).

Key Fig. 7	Control or Indicator	Function
1	Agent Discharge Control Button	Press to discharge agent; press a second time to interrupt discharge. This is a push on, push off type button.
2	Joystick Control Handle	Used for joystick control of bumper turret.
3	Pattern Control Button	Used to adjust shape of discharge spray pattern between stream and fully fog. Push button on left side for fog and right side for stream.
4	Power ON/OFF Switch	Push to **|** (on) position to turn on. Push to O (off) position to turn off.
5	Panel Light	Light illuminates bumper turret controls.

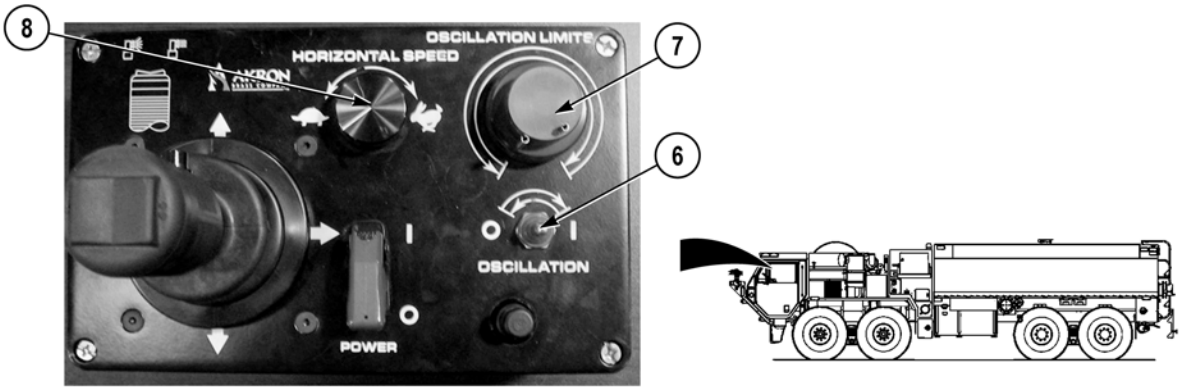


Figure 7. Bumper Turret Controls (Sheet 2 of 2).

Key Fig. 7	Control or Indicator	Function
6	OSCILLATION ON/OFF Switch	Used to activate and deactivate bumper turret auto-oscillation mode. Joystick control handle can be used to elevate or depress bumper turret nozzle during auto-oscillation mode. Joystick control handle will override auto-oscillation mode back to joystick control mode if moved left or right during auto-oscillation mode. To reactivate auto-oscillation mode after joystick override, push oscillation toggle to **|** (on) position. Bumper turret will always reactivate to the left.
7	OSCILLATION LIMITS Control Knob	Used to set left/right limits of auto-oscillation mode. Two oscillation limit control knobs are stacked together. Small knob on top controls right oscillation limit. Larger knob on bottom controls left limit angle. Pin on top of each knob is set point for oscillation limit control.
8	HORIZONTAL SPEED Control	Rotary adjustment to regulate rotation and sweep speed of bumper turret when in joystick control mode or auto-oscillation mode. Full slow position will not stop bumper turret operation.

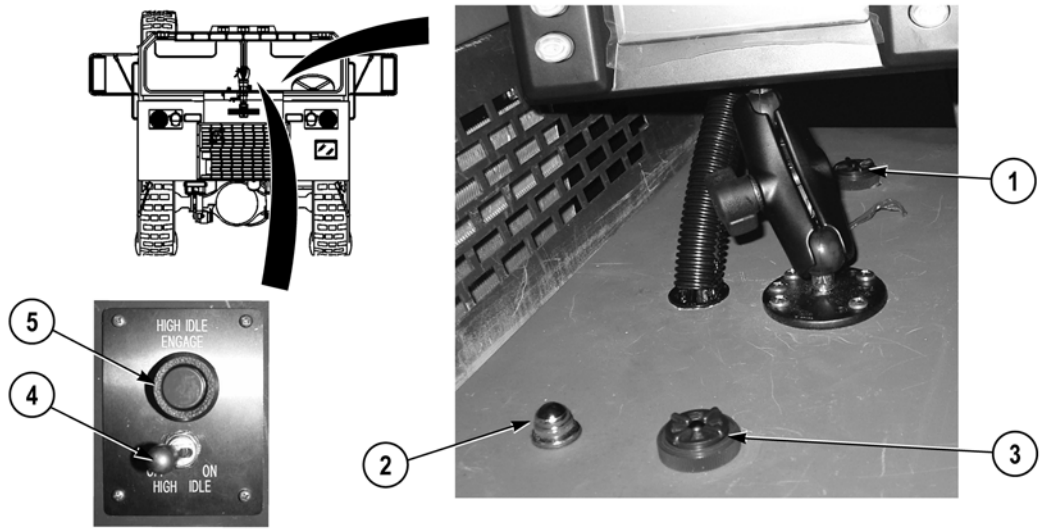


Figure 8. Personnel Cab - Center Console.

Key Fig. 8	Control or Indicator	Function
1	Buzzer Audio Alarm	Provides audible warning in event pressure governor detects a caution or warning condition.
2	Buzzer Audio Alarm Indicator Light	Illuminates red when rear step buzzer button is pushed.
3	Buzzer Audio Alarm	Provides audible warning in event rear step buzzer button is pushed.
4	HIGH IDLE Switch	Used to bring truck engine to 1350 rpm in order for water pump to run at stationary pumping modes.
5	HIGH IDLE ENGAGE Indicator Light	Illuminates when high idle switch is in ON position.

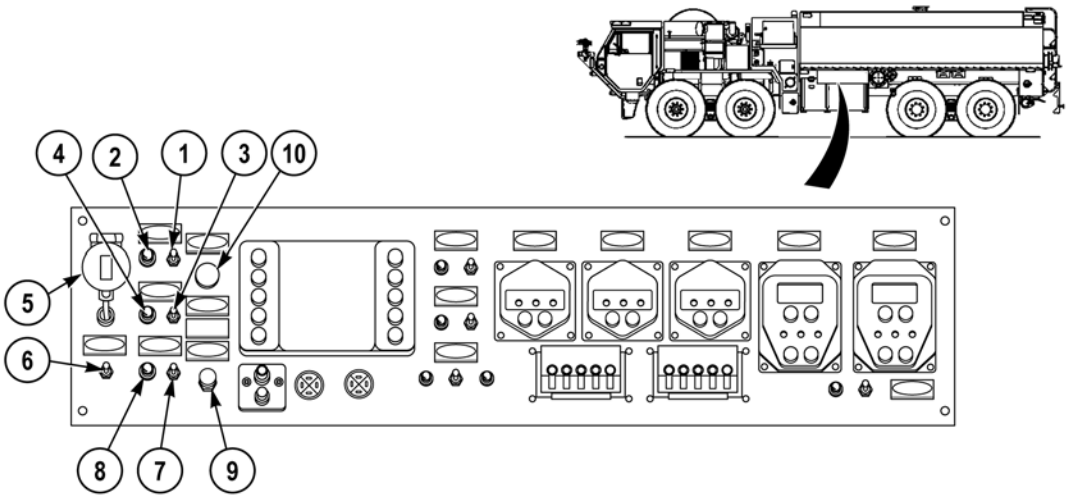


Figure 9. Pump Operator's Panel - Left.

Key Fig. 9	Control or Indicator	Function
1	PUMP COOLER Switch	Pull out and push right to open pump cooler valve and activate pump cooler system. Push left to close pump cooler valve.
2	PUMP COOLER Indicator Light	Illuminates when pump cooler valve is open.
3	FOAM SYSTEM Switch	Pull out and push right to open foam valve and discharge foam into water line. Push left to close foam valve.
4	FOAM SYSTEM Indicator Light	Illuminates when foam valve is open.
5	Headset Jack	Used to communicate with personnel using headset system.
6	PANEL LIGHTS Switch	Illuminates pump operator's panel when switch is ON.
7	FOAM FLUSH Switch	Pull out and push right to open foam flush valve and activate foam flush system. Push left to close foam flush valve.
8	FOAM FLUSH Indicator Light	Illuminates when foam flush valve is open.
9	Driver Main Inlet Primer Button	Push and hold to activate primer pump. Used to prime water pump. Release button to deactivate primer pump.
10	Manual Pressure Control Knob	Used when manual mode is selected to control PTO driven hydraulic pump output pressure.

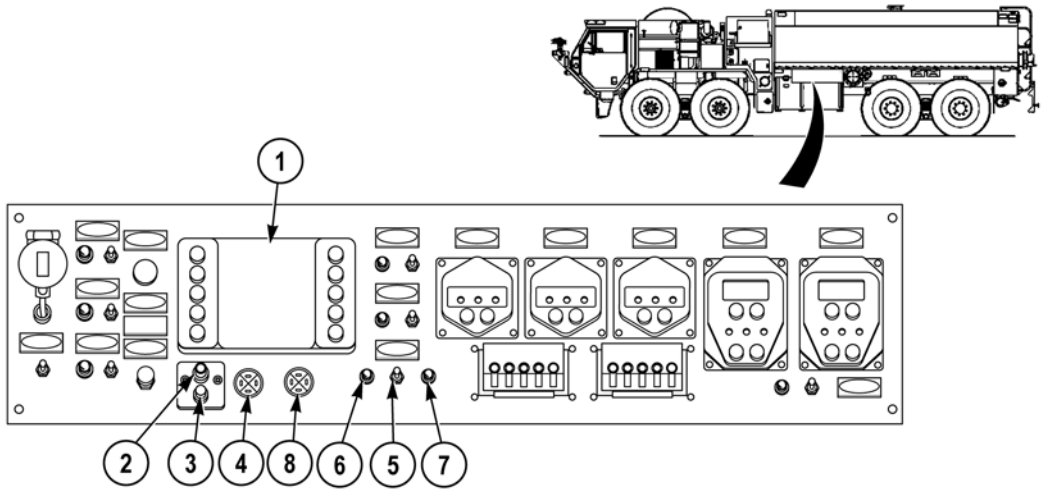


Figure 10. Pump Operator's Panel - Center Left.

Key Fig. 10	Control or Indicator	Function
1	Pressure Governor Display Unit	Used for operating, controlling, and analyzing water system operations.
2	PUMP HOT Indicator Light	Illuminates in the event of a water pump overheat condition.
3	PUMP HOT PUSH TO TEST BUTTON	When depressed, checks operation of both warning buzzer and thermal relief indicator light.
4	Buzzer Audio Alarm	Provides audible warning in event of a water pump overheat condition.
5	DIRECT TANK FILL Switch	Push switch to left to turn DIRECT TANK FILL to AUTO. Push switch to right to turn DIRECT TANK FILL to OPEN. When switch is in center position DIRECT TANK FILL is OFF.
6	DIRECT TANK FILL AUTO Indicator Light	Illuminates when DIRECT TANK FILL switch is in AUTO position.
7	DIRECT TANK FILL OPEN Indicator Light	Illuminates when direct tank fill valve is fully opened.
8	Buzzer Audio Alarm	Provides audible warning in the event pressure governor detects a caution or warning condition.

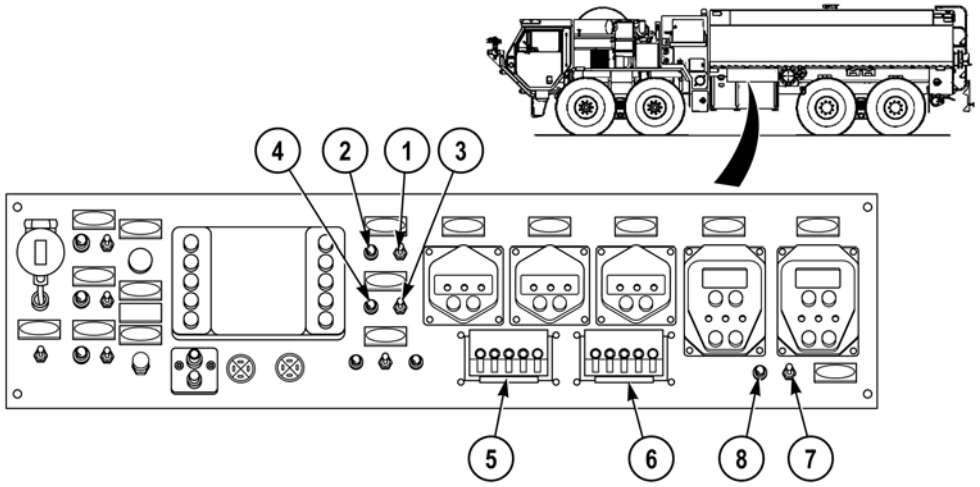


Figure 11. Pump Operator's Panel - Upper Center/Bottom Right.

Key Fig. 11	Control or Indicator	Function
1	TANK TO PUMP Switch	Pull out and push right to open tank discharge valve. Push left to close tank discharge valve.
2	TANK TO PUMP Indicator Light	Illuminates when tank discharge valve is open.
3	REEL DISCHARGE Switch	Pull out and push right to open hose reel discharge valve. Push left to close hose reel discharge valve.
4	REEL DISCHARGE Indicator Light	Illuminates when hose reel discharge valve is open.
5	WATER LEVEL Gauge	Monitors level of water in water tank.
6	FOAM LEVEL Gauge	Monitors level of foam agent in foam tank.
7	Water TANK DRAIN Switch	Pull out and push switch to right to open water tank drain valve. Push switch to left to close water tank drain valve.
8	Water TANK DRAIN Indicator Light	Illuminates when water tank drain valve is open.

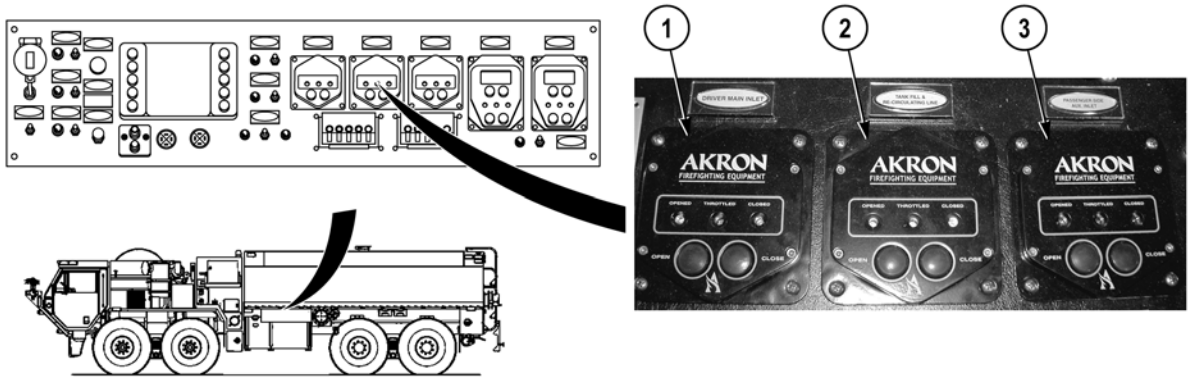


Figure 12. Pump Operator's Panel - Electronic Valves.

Key Fig. 12	Control or Indicator	Function
1	TANK FILL & RE-CIRCULATING LINE Valve Control	Used to operate valve that controls flow of water from pump to onboard water tank. To open valve, push and hold OPEN valve button until valve attains desired position. To close valve, push and hold CLOSE valve button until valve attains desired position. A multi-colored display indicates relative position of valve; fully open (green), throttling position (yellow), and fully closed (red).
2	DRIVER SIDE AUX. INLET Valve Control	Used to operate (electrically actuated) driver side auxiliary inlet valve. To open valve, push and hold OPEN valve button until valve attains desired position. To close valve, push and hold CLOSE valve button until valve attains desired position. A multi-colored display indicates relative position of valve; fully open (green), throttling position (yellow), and fully closed (red).
3	PASSENGER SIDE AUX. INLET Valve Control	Used to operate (electrically actuated) passenger side auxiliary inlet valve. To open valve, push and hold OPEN valve button until valve attains desired position. To close valve, push and hold CLOSE valve button until valve attains desired position. A multi-colored display indicates relative position of valve; fully open (green), throttling position (yellow), and fully closed (red).

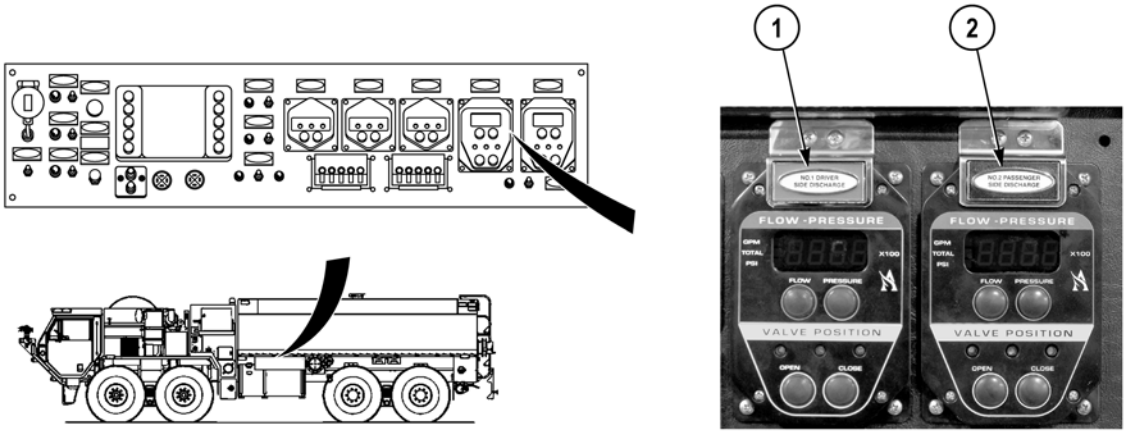


Figure 13. Pump Operator's Panel - Electronic Metering Valves.

Key Fig. 13	Control or Indicator	Function
1	NO. 1 DRIVER SIDE DISCHARGE Electric Valve Control/Meter	Provides control of driver side discharge. Two button operation to read pressure, flow, and total flow. LED readout indicates GPM, total gallons flowed, and psi. Two button, open and close valve position capability with red (closed), yellow (gated), and green (open) LED valve position indicator lights.
2	NO. 2 PASSENGER SIDE DISCHARGE Electric Valve Control/Meter	Provides control of passenger side discharge. Two button operation to read pressure, flow, and total flow. LED readout indicates GPM, total gallons flowed, and psi. Two button, open and close valve position capability with red (closed), yellow (gated), and green (open) LED valve position indicator lights.

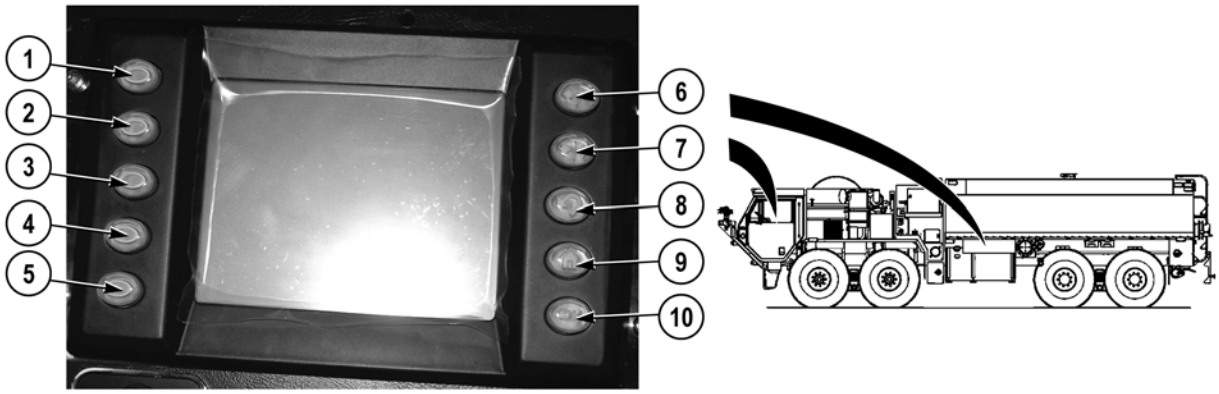


Figure 14. Cab/Pump Operator's Panel Pressure Governor Controls.

Key Fig. 14	Control or Indicator	Function
1	Pump Engaged Indicator Light	Illuminates green once vehicle PTO has been engaged.
2	Throttle Ready Indicator Light	Illuminates green once vehicle PTO has been engaged, vehicle's transmission is in neutral, vehicle's parking brake is activated, and vehicle's high idle has been engaged.
3	Mode Button	Allows user to toggle between pressure mode and manual mode.
4	Preset Button	Used to command pressure governor to automatically set itself to a predetermined pressure setting or pump displacement solenoid position.
5	Idle Button	Allows user to stop flow of water and return pump to a neutral state.
6	Increase Selection	Allows user to adjust output of water flow manually. If system is in pressure mode, user may increase pressure in 3 psi increments for every button push or 75 psi for every button hold. If system is in manual mode, user may increase pump displacement solenoid output by 1% for every button push or 25% for every button hold.
7	Decrease Selection	Allows user to adjust output of water flow manually. If system is in pressure mode, user may decrease pressure in 3 psi increments for every button push or minimum pressure for a button hold. If system is in manual mode, user may decrease pump displacement solenoid output by 1% for every button push or down to 0% displacement for a button hold.
8	Return Button	Returns display to previous screen.
9	Home	Returns display to HOME screen.
10	OK Button	Used if an option or command requires a confirmation step before proceeding with another command.

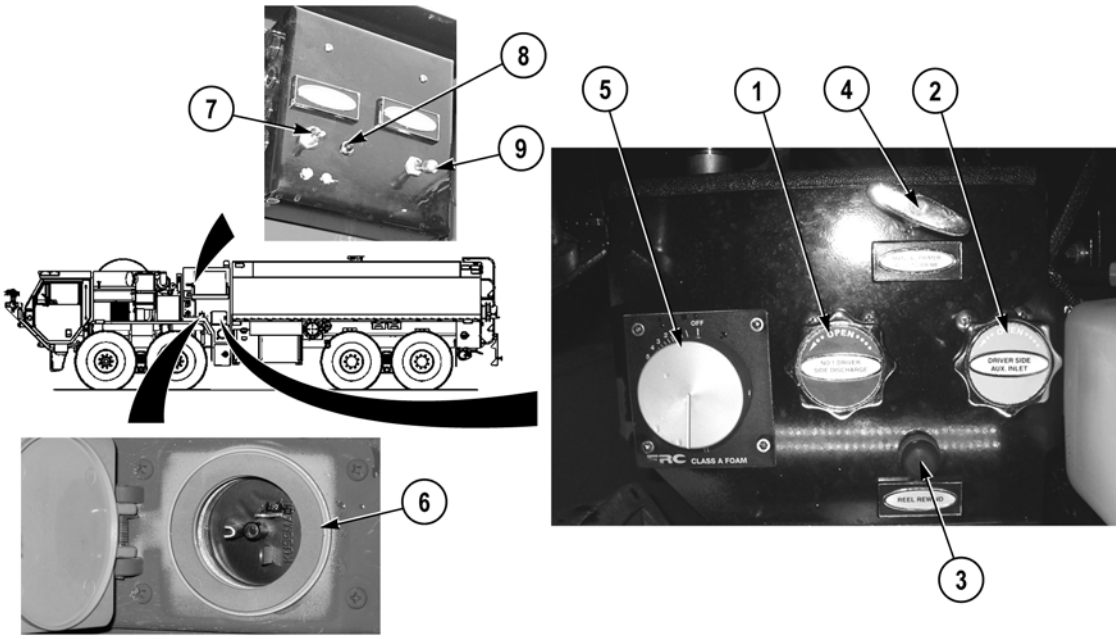


Figure 15. Driver Side - Pump House (Sheet 1 of 2).

Key Fig. 15	Control or Indicator	Function
1	NO. 1 DRIVER SIDE DISCHARGE Drain Valve	Turn valve handle 1/4 turn counterclockwise to open NO. 1 DRIVER SIDE DISCHARGE drain valve. Turn valve handle 1/4 turn clockwise to close NO. 1 DRIVER SIDE DISCHARGE drain valve.
2	DRIVER SIDE AUX. INLET Drain Valve	Turn valve handle 1/4 turn counterclockwise to open DRIVER SIDE AUX. INLET drain valve. Turn valve handle 1/4 turn clockwise to close DRIVER SIDE AUX. INLET drain valve.
3	REEL REWIND Button	Push and hold button to rewind water hose.
4	MANUAL PRIMER Control	Used to bypass electric control circuit for pump primer valve. Pull handle to activate (open) pump primer valve.
5	FOAM METERING Valve	Turn FOAM METERING valve handle counterclockwise to lower foam percentage rate. Turn FOAM METERING valve handle clockwise to raise foam percentage rate.
6	Auto Eject SHORELINE INLET	Used to maintain electrical charge for the chassis battery system.
7	DIESEL HEATER DIAGNOSTICS Switch	Used for maintenance/trouble shooting/heater function.
8	DIESEL HEATER DIAGNOSTICS Indicator Light	Illuminates with a diagnostic flash code.
9	DIESEL HEATER TEST Switch	Push and hold to check that tank heaters are properly working.

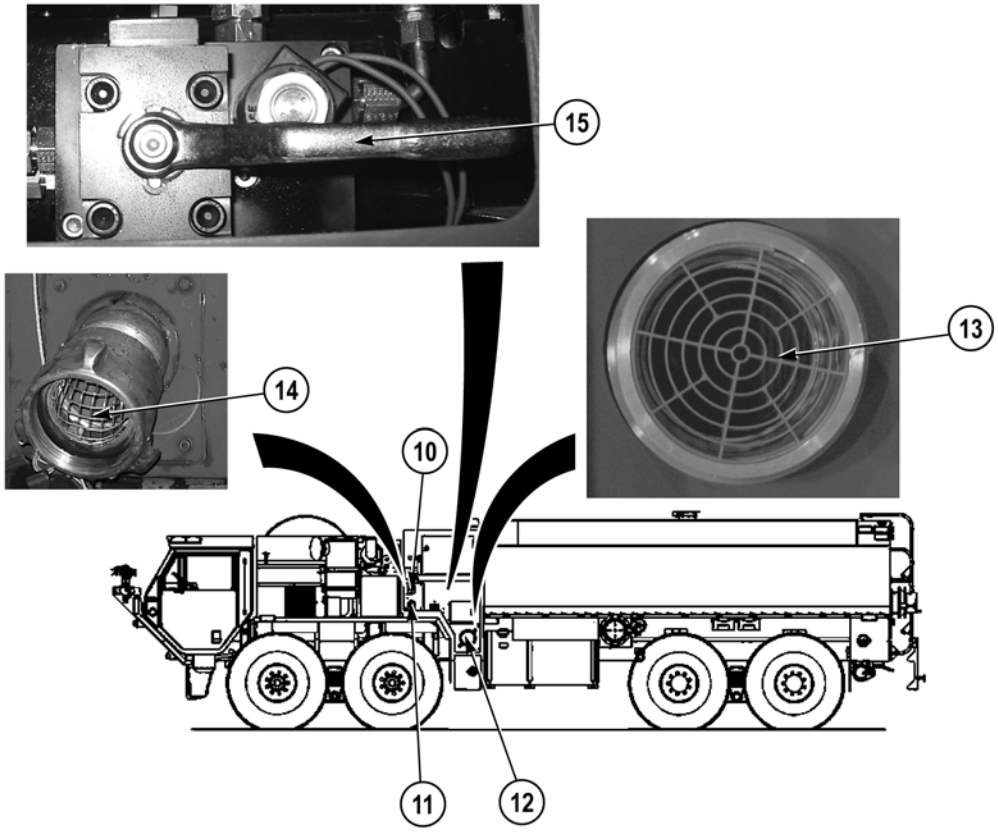


Figure 15. Driver Side - Pump House (Sheet 2 of 2).

Key Fig. 15	Control or Indicator	Function
10	NO. 1 DRIVER SIDE DISCHARGE	Discharge connection for use with 3 in. (7.6 cm) soft discharge hose.
11	DRIVER SIDE AUX. INLET	Used to pump water from hydrant or positive water source.
12	Driver Side Main Inlet	Used to pump water from pond or draft.
13	Main Inlet Strainer	Used to keep debris from entering main inlet.
14	DRIVER SIDE AUX. INLET Strainer	Used to keep debris from entering DRIVER SIDE AUX. INLET.
15	AUTO/MANUAL SELECTOR VALVE	Used to put hydraulic controls in manual operation mode.

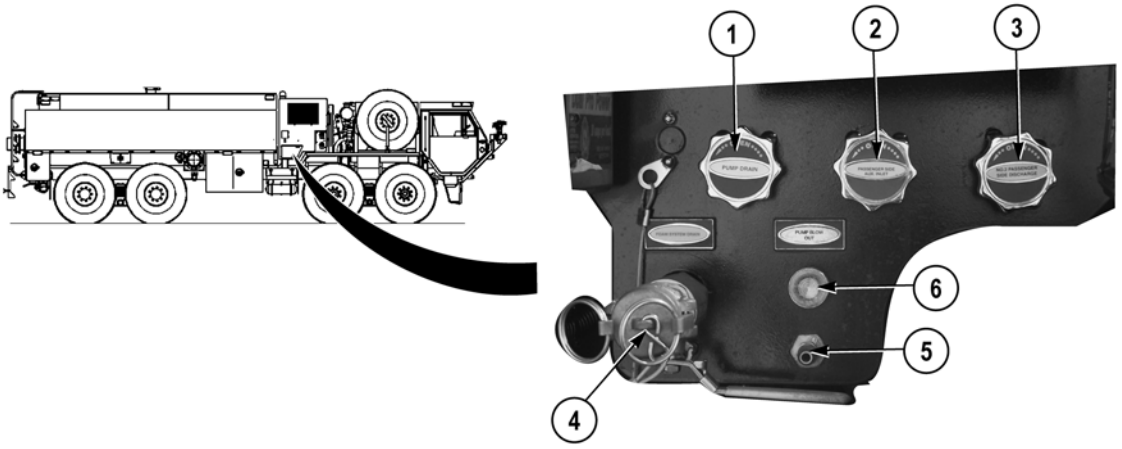


Figure 16. Passenger Side - Pump House (Sheet 1 of 2).

Key Fig. 16	Control or Indicator	Function
1	PUMP DRAIN Valve	Turn valve handle 1/4 turn counterclockwise to open water PUMP DRAIN valve. Turn valve handle 1/4 turn clockwise to close water DRAIN PUMP valve.
2	PASSENGER SIDE AUX. INLET Drain Valve	Turn valve handle 1/4 turn counterclockwise to open PASSENGER SIDE AUX. INLET drain valve. Turn valve handle 1/4 turn clockwise to close PASSENGER SIDE AUX. INLET drain valve.
3	NO. 2 PASSENGER SIDE DISCHARGE Drain Valve	Turn valve handle 1/4 turn counterclockwise to open NO. 2 PASSENGER SIDE DISCHARGE drain valve. Turn valve handle 1/4 turn clockwise to close NO. 2 PASSENGER SIDE DISCHARGE drain valve.
4	FOAM SYSTEM DRAIN Valve	Turn valve handle 1/4 turn left to open foam system drain valve. Turn valve handle 1/4 turn right to close foam system drain valve.
5	PUMP BLOW OUT Air Supply Fitting	Used to connect air supply for water system blow-out procedures.
6	PUMP BLOW OUT Air Supply Valve	Pull out handle to open air supply valve. Push in knob to close air supply valve.

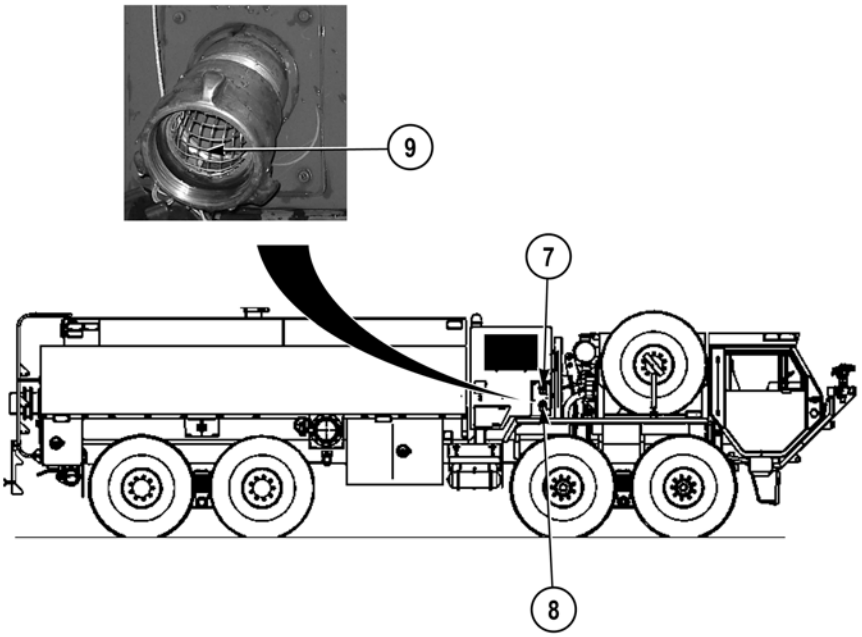


Figure 16. Passenger Side - Pump House (Sheet 2 of 2).

Key Fig. 16	Control or Indicator	Function
7	NO. 2 PASSENGER SIDE DISCHARGE	Discharge connection for use with 3 in. (7.6 cm) soft discharge hose.
8	PASSENGER SIDE AUX. INLET	Used to pump water from hydrant or positive water source.
9	PASSENGER SIDE AUX. INLET Strainer	Used to keep debris from entering PASSENGER SIDE AUX. INLET.

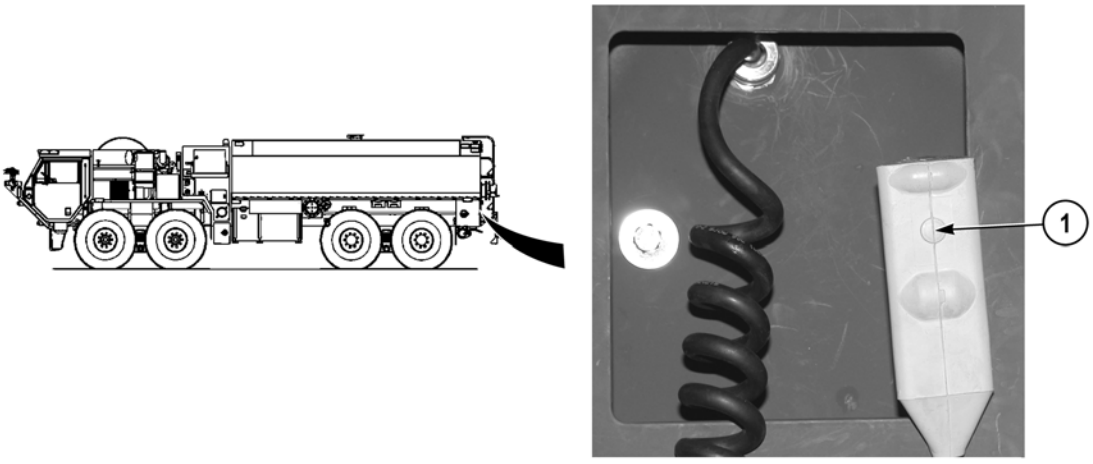


Figure 17. Driver Side - Rear Vehicle.

Key Fig. 17	Control or Indicator	Function
1	Rear Step Buzzer Control	Push once to tell driver to stop, twice to go, and three times to back up.

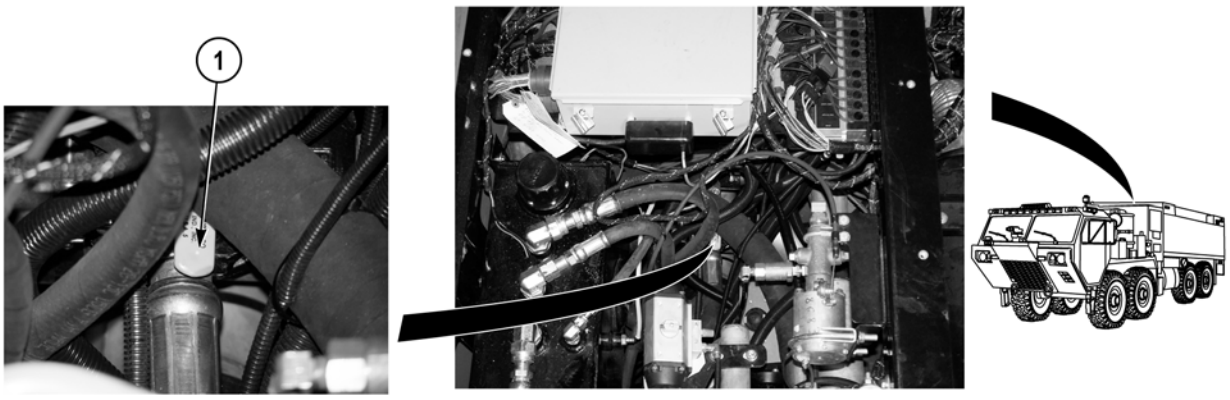


Figure 18. Pump House Top.

Key Fig. 18	Control or Indicator	Function
1	FOAM SYSTEM SERVICE VALVE	Used to stop foam solution from entering water pumping system.

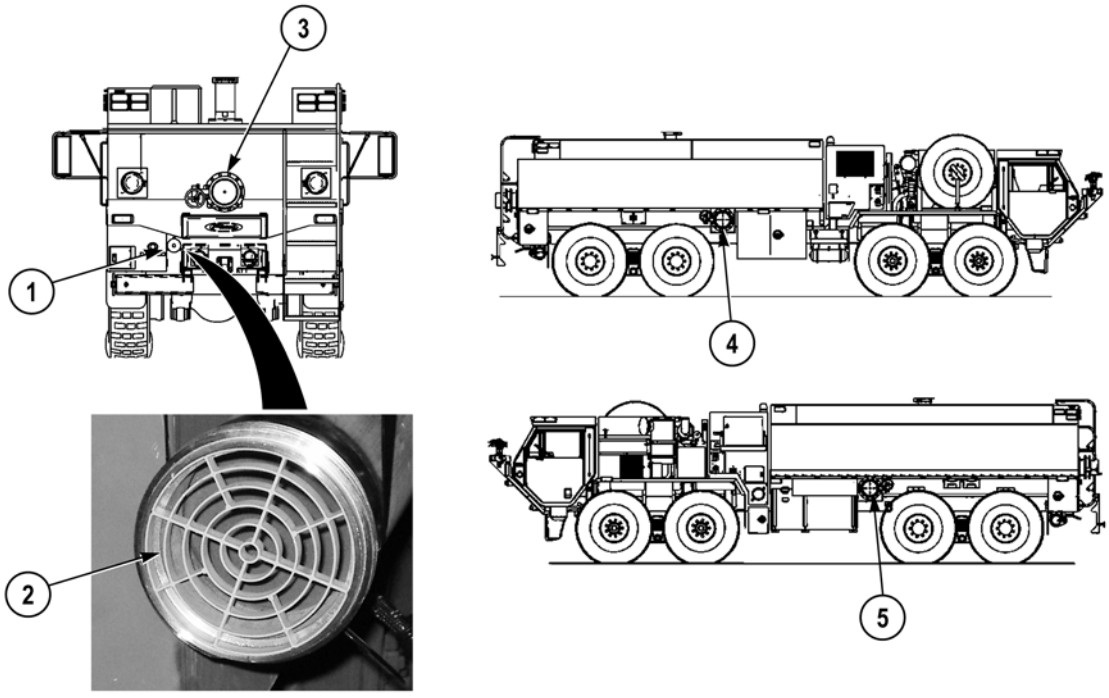


Figure 19. Vehicle Water Tank Body - Rear/Sides.

Key Fig. 19	Control or Indicator	Function
1	DIRECT TANK FILL Inlet	Used to fill water tank from positive water source.
2	DIRECT TANK FILL Inlet Strainer	Used to keep debris from DIRECT TANK FILL Inlet.
3	Rear Manual Water Tank Dump Valve	Used to drain water from water tank.
4	Passenger Side Manual Water Tank Dump Valve	Used to drain water from water tank.
5	Driver Side Manual Water Tank Dump Valve	Used to drain water from water tank.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PREPARE TO OPERATE VEHICLE

Refer to TM 9-2320-279-10 for procedure on preparing to operate vehicle.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PREPARATION FOR OPERATION-OPERATIONAL MODES

NOTE

A complete HEWATT crew is required to perform firefighting operations.

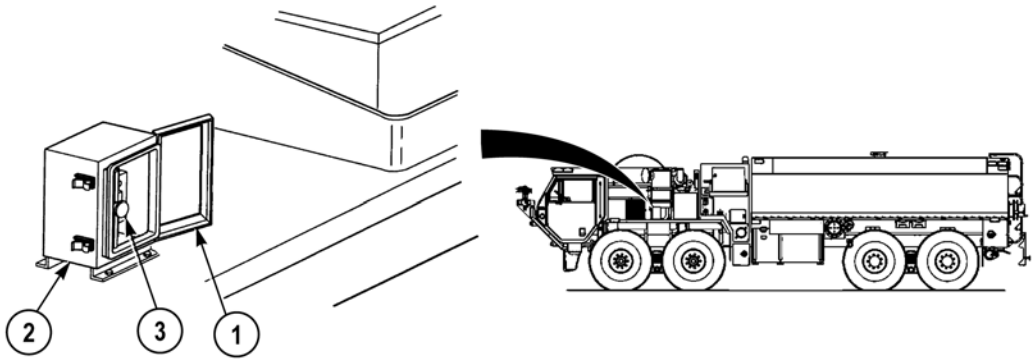
1. Ensure battery disconnect is in closed position (WP 0007).
2. Ensure foam and instrument control panel are in standby mode (WP 0022).
3. Ensure all tanks are full per mission requirement (WP 0014) and (WP 0021).
4. Ensure all personnel are familiarized with department procedures for setting wheel chocks (TM 9-2320-279-10).

END OF WORK PACKAGE

OPERATOR MAINTENANCE

BATTERIES CONNECT/DISCONNECT

DISCONNECT BATTERIES



WARNING

Remove all jewelry, such as rings, dog tags, bracelets, etc. If jewelry or tools contact electrical circuits, a direct short may result. Failure to comply may result in injury or death to personnel or damage to equipment.

1. Open door (1) of battery disconnect switch box (2).
2. Pull battery disconnect switch (3) to off position.
3. Close and latch door (1) of battery disconnect switch box (2).

END OF TASK

CONNECT BATTERIES

1. Open door (1) of battery disconnect switch box (2).
2. Push battery disconnect switch (3) to on position.
3. Close and latch door (1) of battery disconnect switch box (2).

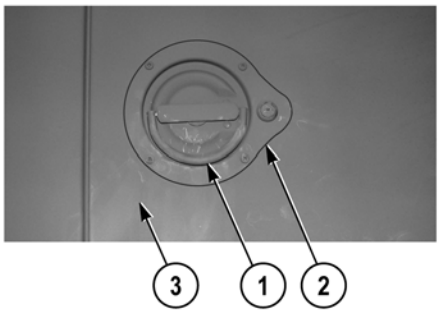
END OF TASK

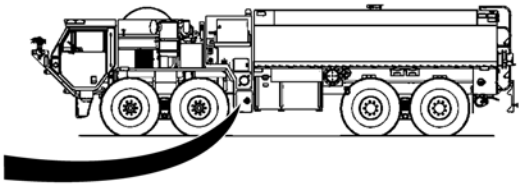
END OF WORK PACKAGE

OPERATOR MAINTENANCE

COMPARTMENT DOOR OPEN/CLOSE

OPEN D-RING HANDLE COMPARTMENT DOOR D2





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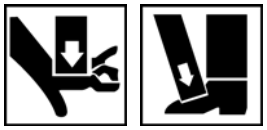


- **Items in compartments may have shifted or come loose during operations. Use caution and be aware that items may fall out while opening doors, causing injury to personnel.**
- **When parked on side slope, items inside compartment may fall out. Use caution and be aware that items may fall out while opening doors, causing injury to personnel.**

1. Pull out D-ring (1) on door handle (2) and turn 1/4 turn clockwise.
2. Slowly open compartment door (3).

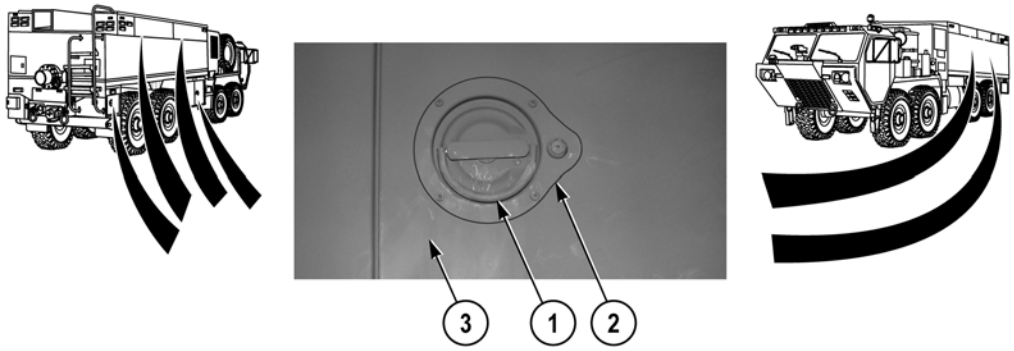
END OF TASK

CLOSE D-RING HANDLE COMPARTMENT DOOR D2

1. Ensure all items are properly stored.
2. Close compartment door (3).
3. Turn D-ring (1) on door handle (2) 1/4 turn counterclockwise.
4. Push in D-ring (1).

END OF TASK

OPEN D-RING HANDLE COMPARTMENT DOORS D1, P1, P2, T1, T2, AND T3



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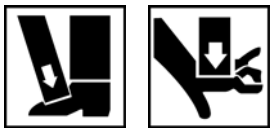


- **Items in compartment may have shifted or come loose during operations. Use caution and be aware that items may fall out while operating door, causing injury to personnel.**
- **When parked on side slope, items inside compartment may fall out. Use caution and be aware that items may fall out while opening doors, causing injury to personnel.**
- **Top compartment doors that swing up are heavy. Ensure personnel has a firm grip on door when opening. Failure to comply may result in injury to personnel.**

NOTE

Compartment door handles D1, P1, P2, T1, T2, and T3 all operate the same way. Compartment door D1 shown.

1. Pull out D-Ring (1) on door handle (2) and turn 1/4 turn clockwise.
2. Slowly open compartment door (3).

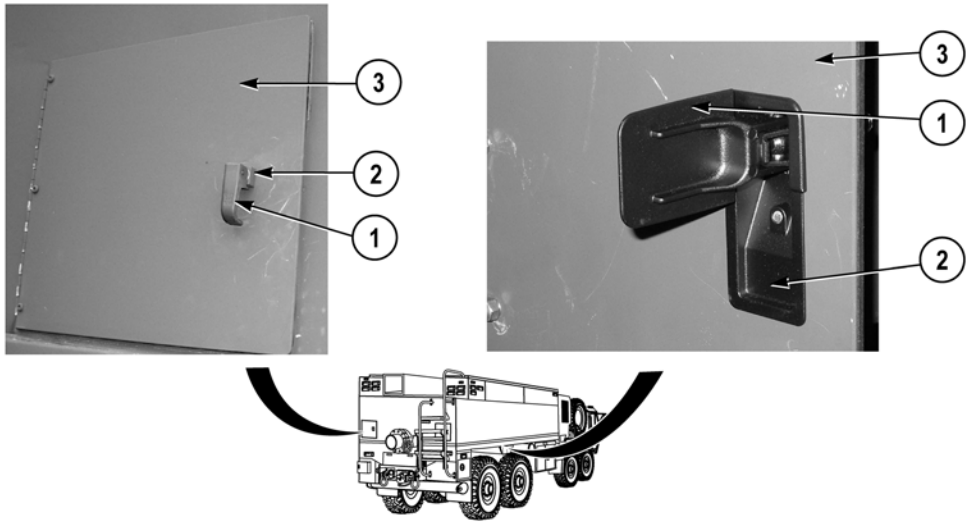
END OF TASK

CLOSE D-RING HANDLE COMPARTMENT DOORS D1, P1, P2, T1, T2, AND T3

1. Ensure all items are properly stowed.
2. Close compartment door (3).
3. Turn D-Ring (1) on door handle (2) 1/4 turn counterclockwise.
4. Check that compartment door (3) is securely latched.

END OF TASK

OPEN LIFT-TURN LATCH COMPARTMENT DOORS



1. Pull out latch (1) on door handle (2) and turn 1/4 turn.
2. Slowly open compartment door (3).

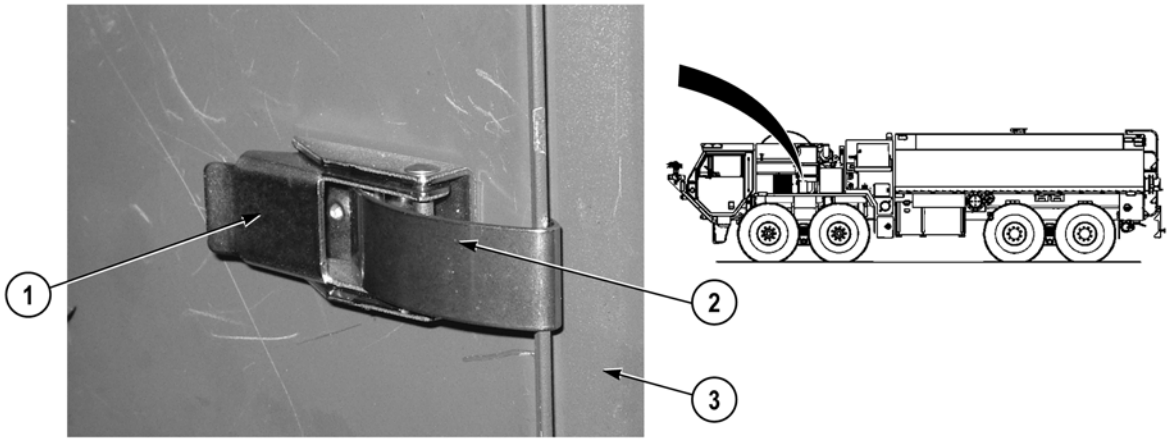
END OF TASK

CLOSE LIFT-TURN LATCH COMPARTMENT DOORS

1. Ensure all items are properly stored.
2. Close compartment door (3).
3. Turn latch (1) on door handle (2) 1/4 turn.
4. Push in latch (1) on door handle.

END OF TASK

OPEN DRAW LATCH COMPARTMENT DOOR



1. Pull out on draw latch handle (1).
2. Pull latch hook (2) away from compartment door (3).
3. Open compartment door (3).

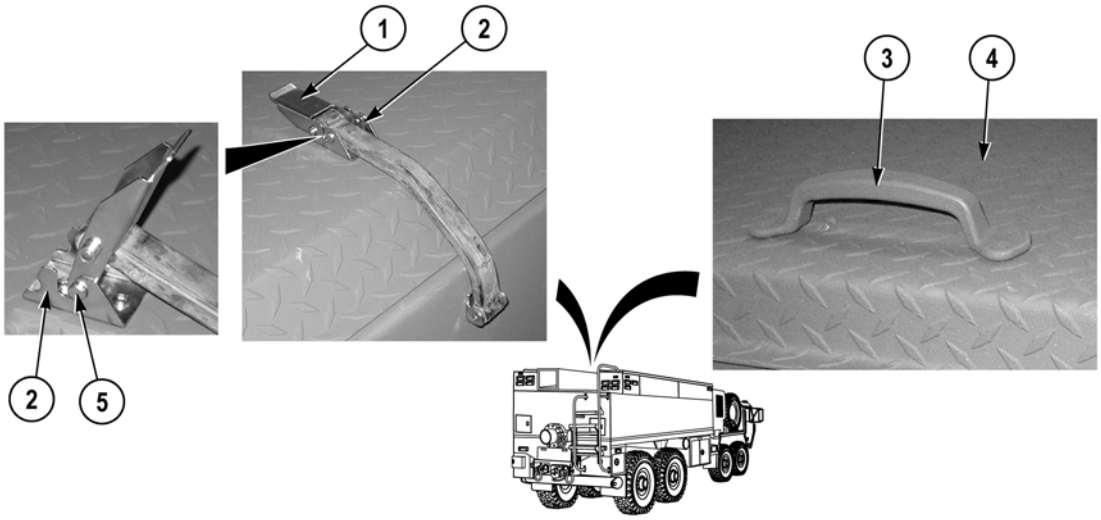
END OF TASK

CLOSE DRAW LATCH COMPARTMENT DOOR

1. Close compartment door (3).
2. Push latch hook (2) in to catch on compartment door (3).
3. Push draw latch handle (1) until draw latch handle (1) snaps into closed position.

END OF TASK

OPEN HOSE BED COVER COMPARTMENT DOORS



WARNING

Compartment doors that swing up are heavy. Ensure a firm grip on door when opening. Failure to comply may result in injury to personnel.

1. Pull handle (1) up and lift out of latch bracket (2).
2. Lift on door handle (3) to open hose bed compartment door (4).

END OF TASK

CLOSE HOSE BED COVER COMPARTMENT DOORS

NOTE

Ensure hose is stored properly in hose bed.

1. Close compartment door (4).
2. Install pin (5) into latch bracket (2).
3. Push down on handle (1) until handle snaps into latch bracket (2).

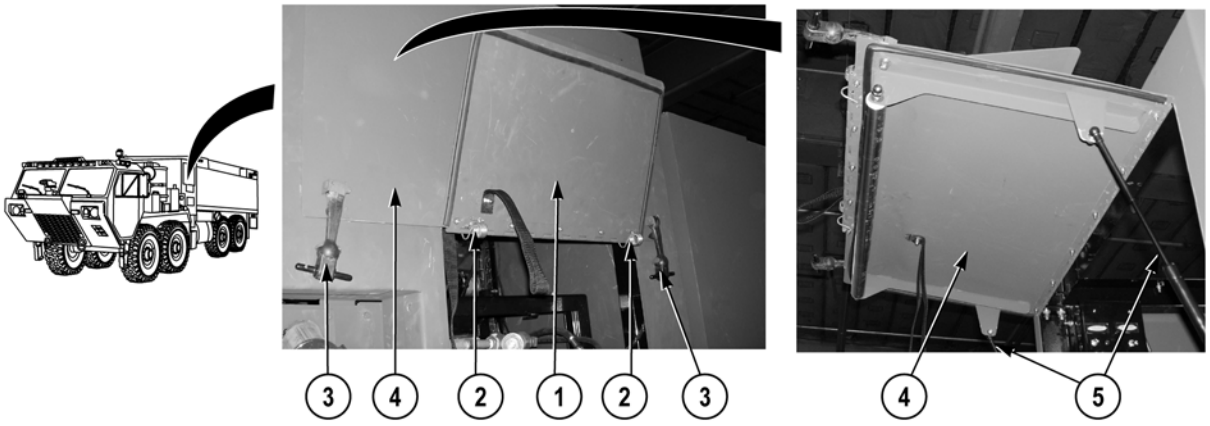
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PUMP HOUSE ACCESS DOOR ASSEMBLY OPEN/CLOSE

OPEN PUMP HOUSE ACCESS DOOR



WARNING

When lifting up on pump house door(s), ensure door(s) are opened far enough for springs to securely hold door in the open position. Failure to comply could result in injury to personnel or damage to equipment.

1. Lift up on lower pump house access door (1) until door is held securely in up position by door springs (2).

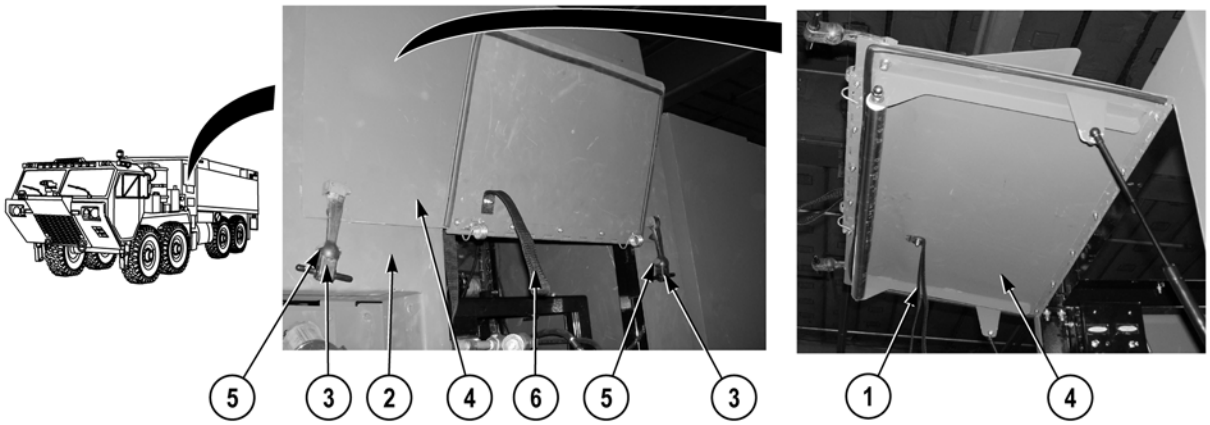
NOTE

Perform Steps (2) and (3) to open upper pump house access door.

2. Release two rubber hooks (3) on upper pump house access door (4).
3. Lift up on upper pump house access door (4) until door is held securely in up position by door springs (5).

END OF TASK

CLOSE PUMP HOUSE ACCESS DOOR



NOTE

Perform Steps (1) and (2) to close upper pump house access door.

1. Pull down on upper pump house access panel pull strap (1) until door contacts pump house (2).
2. Attach two rubber hooks (3) on upper pump house access door (4) to pump house latches (5).
3. Pull down on lower pump house access panel pull strap (6) until door contacts pump house (2).

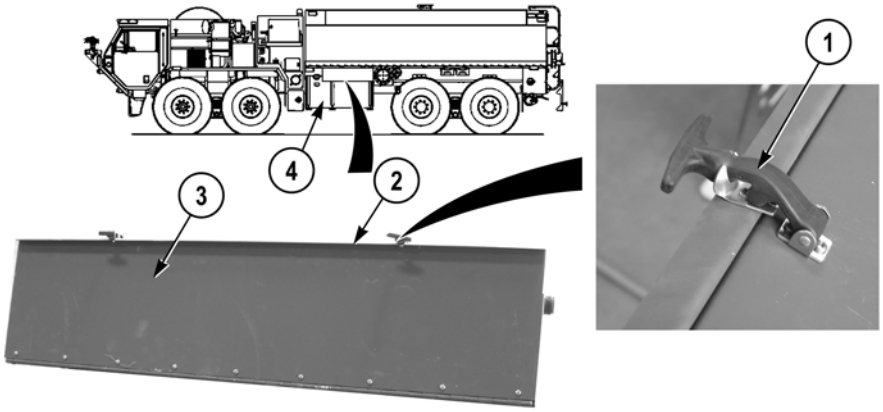
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

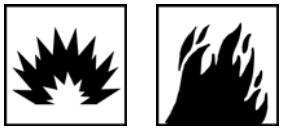
PUMP OPERATOR'S PANEL COVER OPEN/CLOSE

OPEN PUMP OPERATOR'S PANEL COVER



1. Release two rubber hooks (1) from pump operator's panel enclosure (2).

WARNING



Fuel tank is located under pump operator's panel enclosure. Do not let pump operator's panel cover slam into fuel tank. Failure to comply may result in injury or death to personnel and damage to equipment.

2. Carefully lower pump operator's panel cover (3) down to rest against fuel tank (4).

END OF TASK

CLOSE PUMP OPERATOR'S PANEL COVER

1. Raise pump operator's panel cover (3) to meet pump operator's panel enclosure (2).
2. Connect two rubber hooks (1) to pump operator's panel enclosure (2).

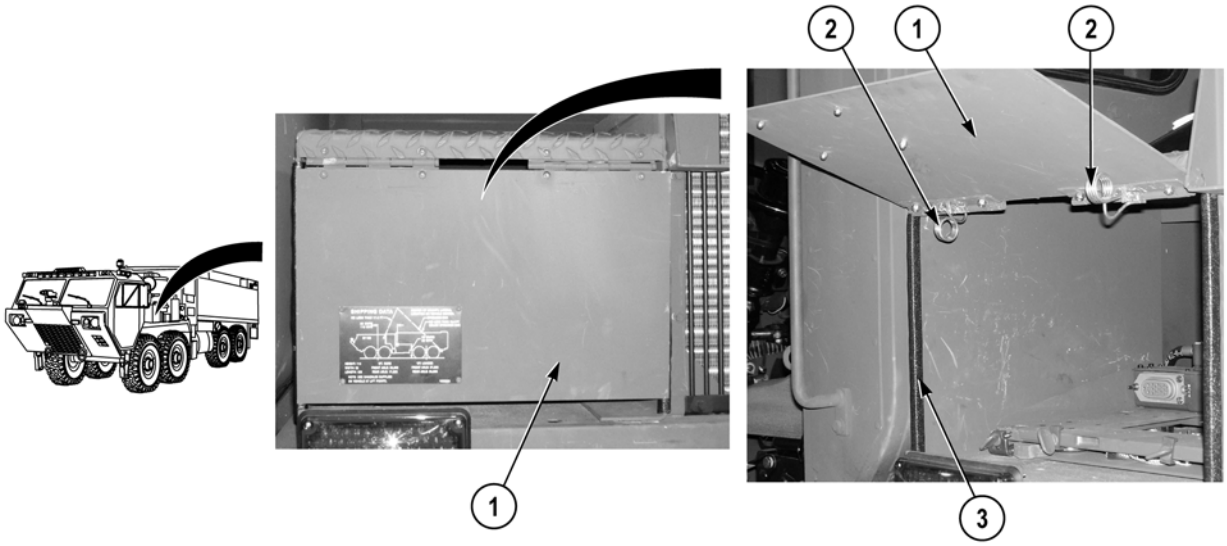
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

SINCGARS COVER DOOR OPEN/CLOSE

OPEN SINCGARS COMPARTMENT ACCESS DOOR



Lift up on SINCGARS compartment access door (1) until door is held in up position by door springs (2).

END OF TASK

CLOSE SINCGARS COMPARTMENT ACCESS DOOR

Push down on SINCGARS compartment access door cover (1) until door contacts SINCGARS compartment (3).

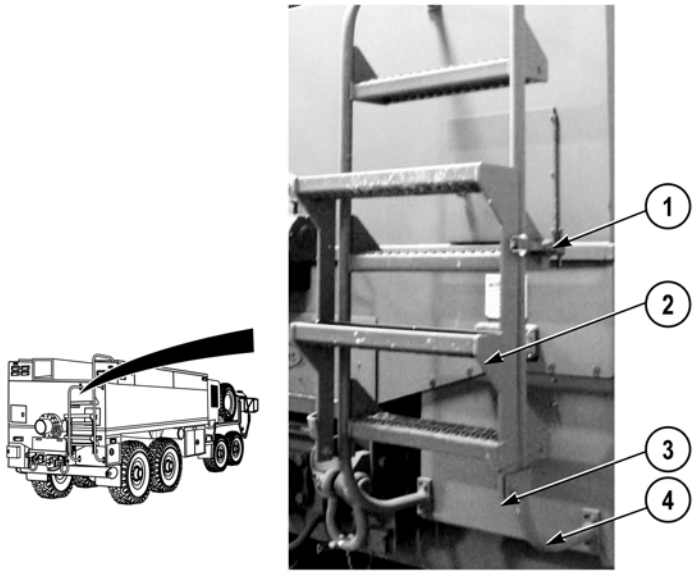
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

RIGHT REAR ACCESS LADDER STOW/UNSTOW

UNSTOW RIGHT REAR ACCESS LADDER



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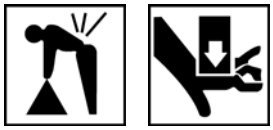


Properly support right rear access ladder before removing rubber hook. Failure to comply may result in injury to personnel.

1. Release rubber hook (1) on right rear access ladder section (2).

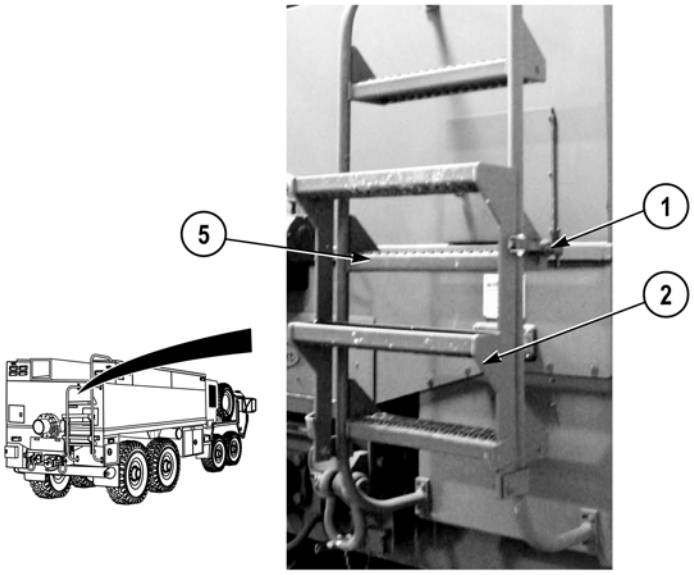
WARNING

Care must always be taken when climbing on and off vehicle. Always face vehicle, use steps and grab handles, and maintain three points of contact with vehicle (two feet/one hand or two hands/one foot). Keep steps, grab handles, and walkways clean, and be extra careful in wet, icy, or muddy conditions. Failure to comply may result in personnel slipping and falling, causing injury or death to personnel.

2. Slowly lower right rear access ladder section (2) down until bumper (3) contacts handrail tubing (4).

END OF TASK

STOW RIGHT REAR ACCESS LADDER



1. Raise lower right rear access ladder section (2) to upper right rear ladder section (5) and connect rubber hook (1).
2. Pull on lower right rear access ladder section (2) and ensure that lower right rear access ladder is secure.

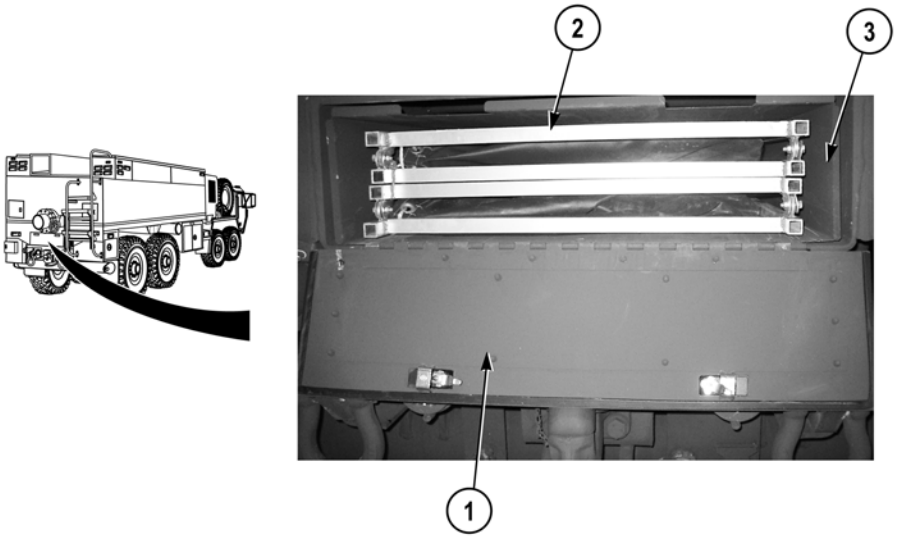
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PORTABLE WATER TANK STOW/UNSTOW

UNSTOW PORTABLE WATER TANK

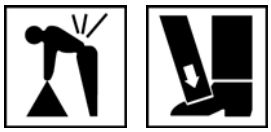


NOTE

Position portable water tank so that vehicle can be moved away from portable water tank after filling.

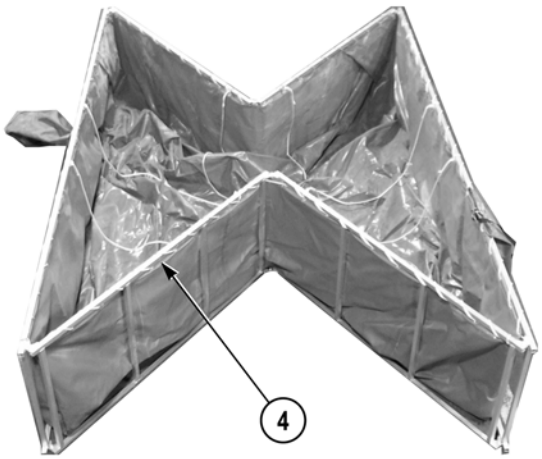
1. Open portable water tank stowage compartment door (1).

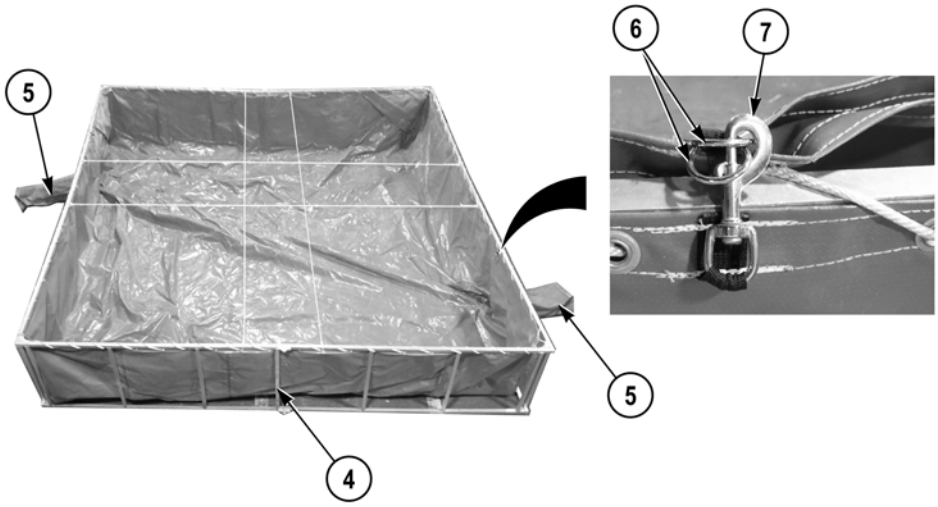
WARNING



- **Portable water tank is heavy. Be sure to have a good handhold and good footing before attempting to unstow portable water tank. Failure to comply may result in injury to personnel.**
- **Always use two personnel when stowing and unstowing portable water tank. Failure to comply may result in injury to personnel.**

2. With personnel on each side of portable water tank (2), pull out and lift portable water tank (2) out of stowage compartment (3).

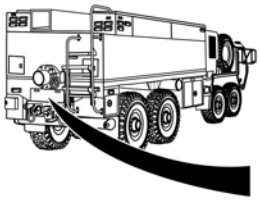


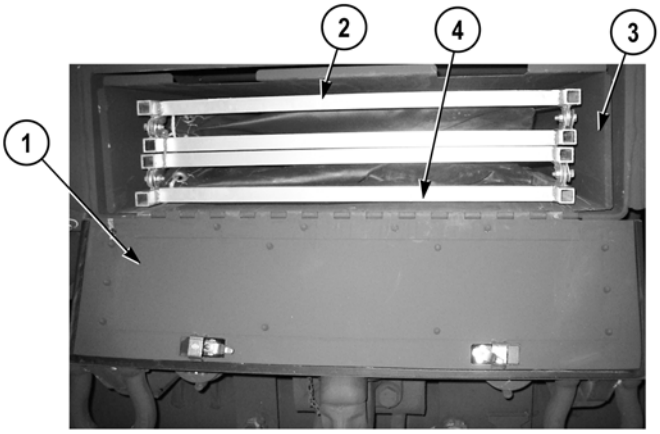


3. Unfold portable water tank support frame (4).
4. Raise both drain tubes (5) and attach rings (6) to clasp (7) before filling.
5. Complete mission.

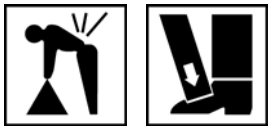
END OF TASK

STOW PORTABLE WATER TANK





WARNING



- **Portable water tank is heavy. Be sure to have a good handhold and good footing before attempting to stow portable water tank. Failure to comply may result in injury to personnel.**
- **Always use two personnel when stowing and unstowing portable water tank. Failure to comply may result in injury to personnel.**
- **Never attempt to drain portable water tank, unless portable water tank is less than 1/2 full. Failure to comply may result in injury to personnel and/or damage to equipment.**

NOTE

Ensure portable water tank is completely drained before stowing.

1. Drain portable water tank (2).

CAUTION

Fabric must be tucked completely within tank frame before stowing. Tank fabric should not contact stowage compartment during stowing procedures. Failure to comply may result in damage to equipment.

2. Fold water tank support frame (4), ensuring fabric is tucked into frame.
3. With personnel on each side of portable water tank (2), lift up and slide portable water tank into stowage compartment (3).
4. Close and latch portable water tank stowage compartment door (1).

END OF TASK

END OF WORK PACKAGE

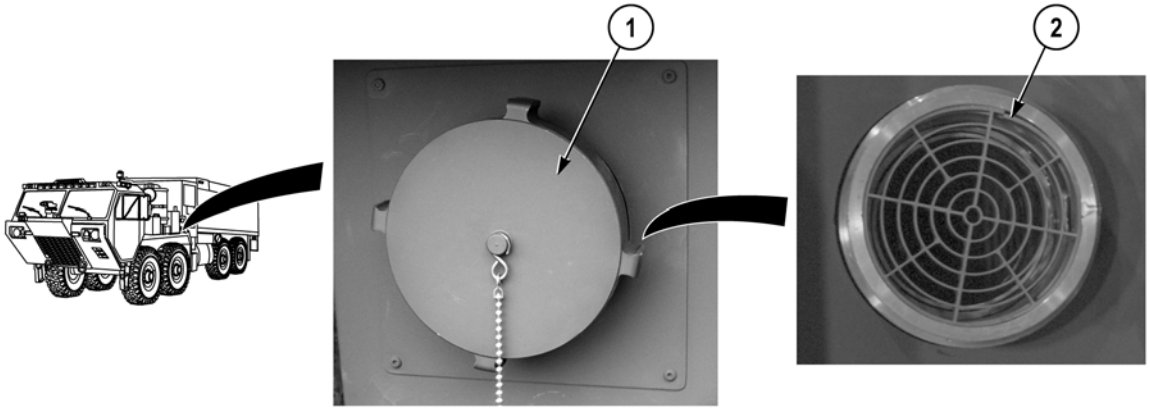
OPERATOR MAINTENANCE

WATER TANK FILL/DRAIN

NOTE

The HEWATT can be filled five different ways; Main Inlet (Positive Water Source), Auxiliary Inlets, Direct Tank Fill, Overhead Fill, and Filling from Draft.

MAIN INLET (POSITIVE WATER SOURCE)

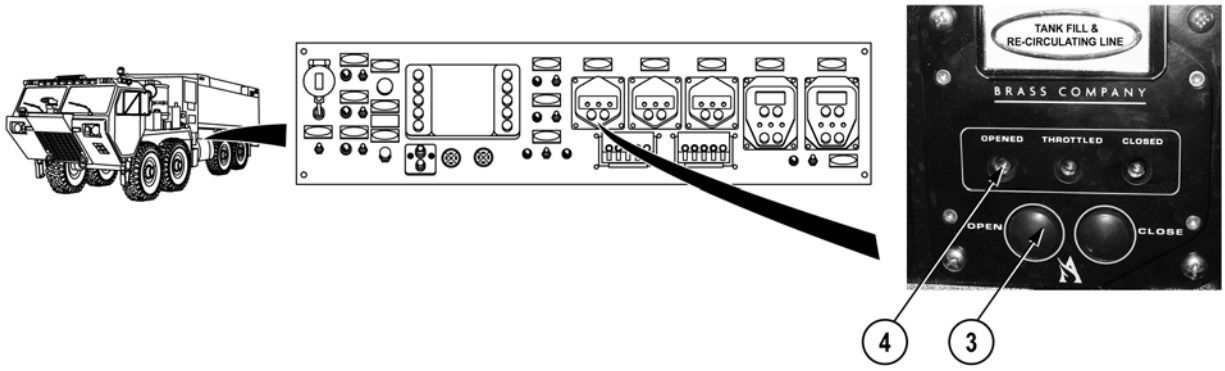


1. Remove cap (1) from driver side main inlet (2).

WARNING

Do not use hard suction hose when filling from positive water source. Hard suction hose will not hold pressure. Hose may fail and separate causing injury to personnel and/or damage to equipment.

2. Connect 5 in. (13 cm) soft discharge hose to driver side main inlet (2) and positive water source.



WARNING

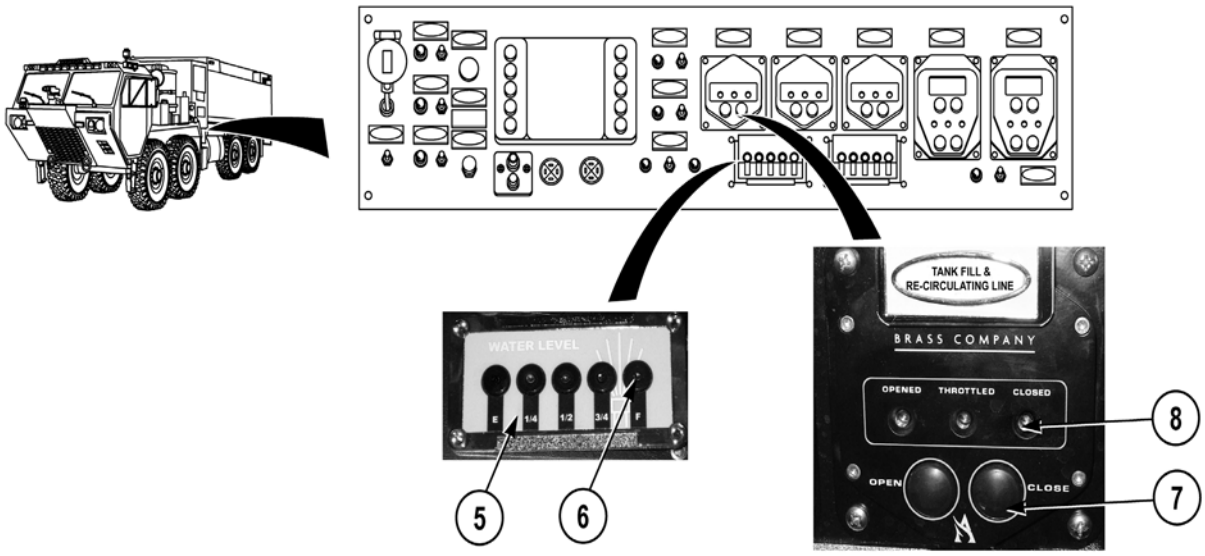
Perform Step (5) before Step (3) if pumping in relay from a pressurized water source. Failure to comply may result in death or injury to personnel or damage to equipment.

3. Open supply valve on positive water source.

NOTE

Valve is completely opened when green indicator light illuminates.

4. Push TANK FILL & RE-CIRCULATING LINE valve control OPEN button (3) until green indicator light (4) illuminates.



WARNING

Monitor water level gauge while water tank is filling in freezing temperatures. Water tank overflow may cause slippery conditions on and around vehicle. Failure to comply may result in death or injury to personnel or damage to equipment.

5. Monitor WATER LEVEL gauge (5) until full (F) light (6) illuminates.

WARNING

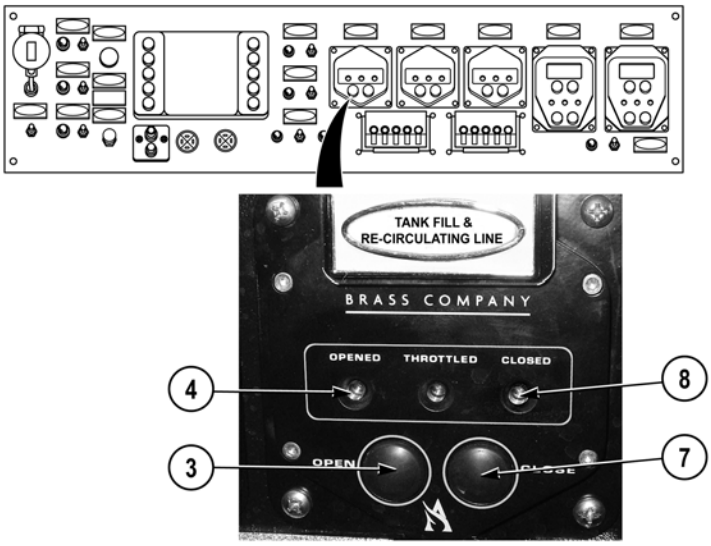
Perform Step (10) before Step (8) if pumping in relay from a pressurized water source. Failure to comply may result in death or injury to personnel or damage to equipment.

NOTE

Valve is completely closed when red indicator light illuminates.

6. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (7) until red indicator light (8) illuminates.

7. Close supply on positive water source.

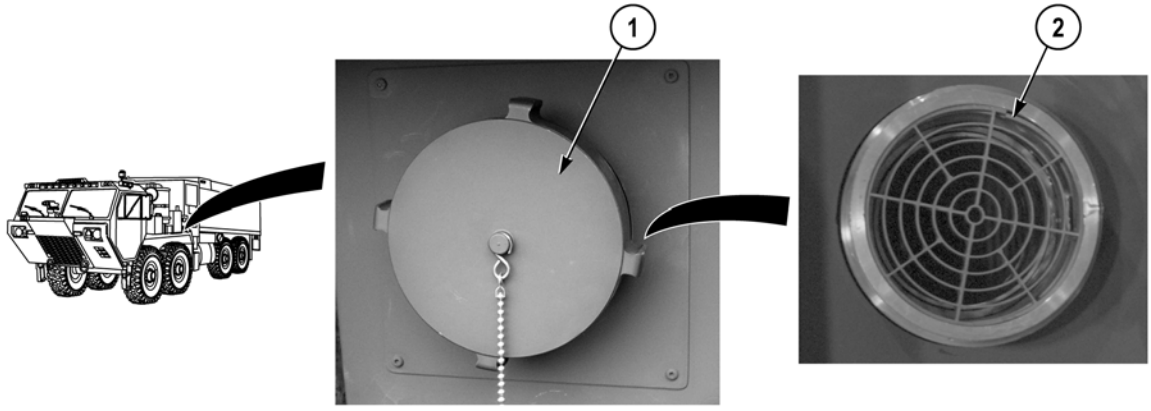


WARNING

Ensure pressure gauges and hose pressure gauges are at zero prior to disconnecting any suction or discharge hoses or removing caps. System operates at extreme pressure. Failure to comply may result in injury or death to personnel.

8. Push TANK FILL & RE-CIRCULATING LINE valve control OPEN button (3) to relieve system pressure. Indicator light (4) will illuminate.

9. When pressure governor pump discharge pressure gauge reads 0 psi (0 kPa), push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (7). Indicator light (8) will illuminate.

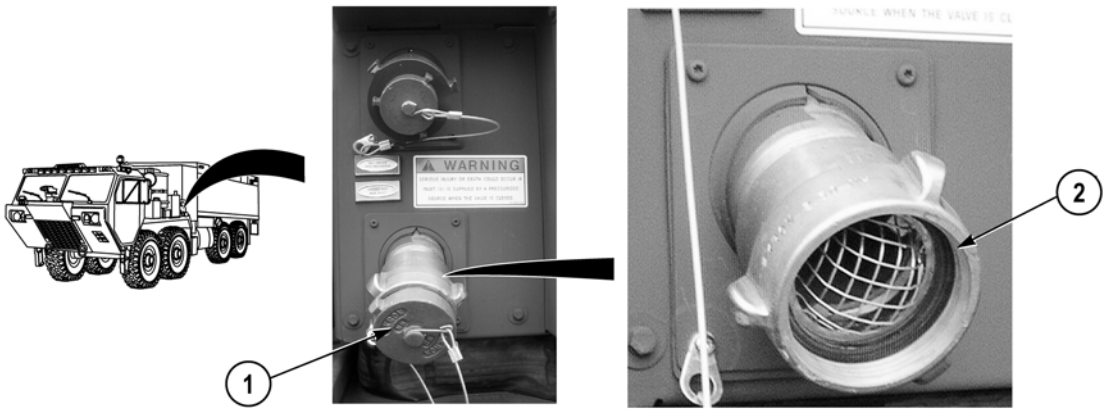


10. Disconnect 5 in. (13 cm) soft discharge hose from main inlet (2) and positive water source.

11. Install cap (1) on main inlet (2).

END OF TASK

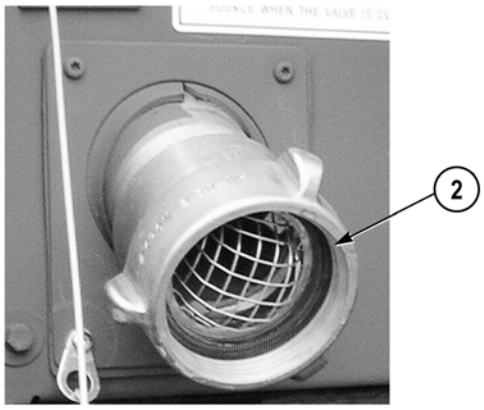
AUXILIARY INLETS



NOTE

DRIVER SIDE and PASSENGER SIDE AUX. INLETS operate the same way. DRIVER SIDE AUX. INLET shown.

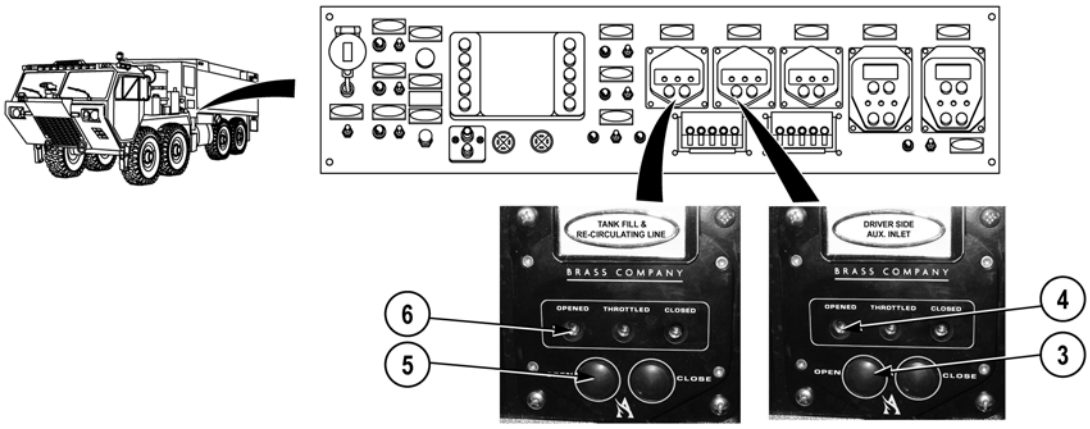
1. Remove cap (1) from DRIVER SIDE AUX. INLET (2).



WARNING

Do not use hard suction hose when filling from positive water source. Hard suction hose will not hold pressure. Hose may fail and separate, causing injury to personnel and/or damage to equipment.

2. Connect 3 in. (7.6 cm) soft discharge hose to DRIVER SIDE AUX. INLET (2) and positive water source.



WARNING

If positive water source is from a pressurized system, open DRIVER SIDE AUX. INLET valve control prior to opening supply valve on positive water source. Failure to comply may cause injury to personnel and/or damage to equipment.

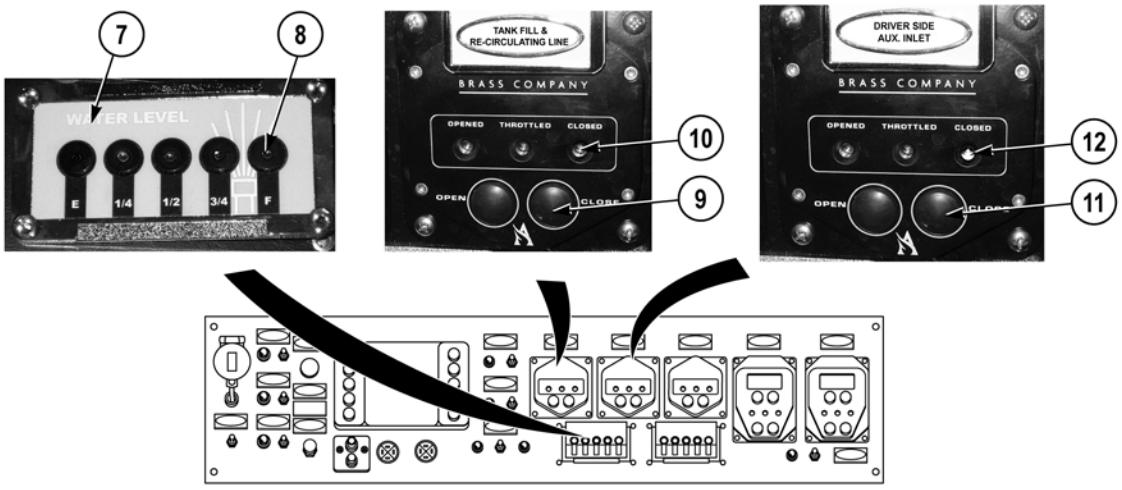
3. Open supply valve on positive water source.

NOTE

Valve is completely opened when green indicator light illuminates.

4. Push DRIVER SIDE AUX. INLET valve control OPEN button (3) until green indicator light (4) illuminate.

5. Push TANK FILL & RE-CIRCULATING LINE valve control OPEN button (5) until green indicator light (6) illuminates.



WARNING

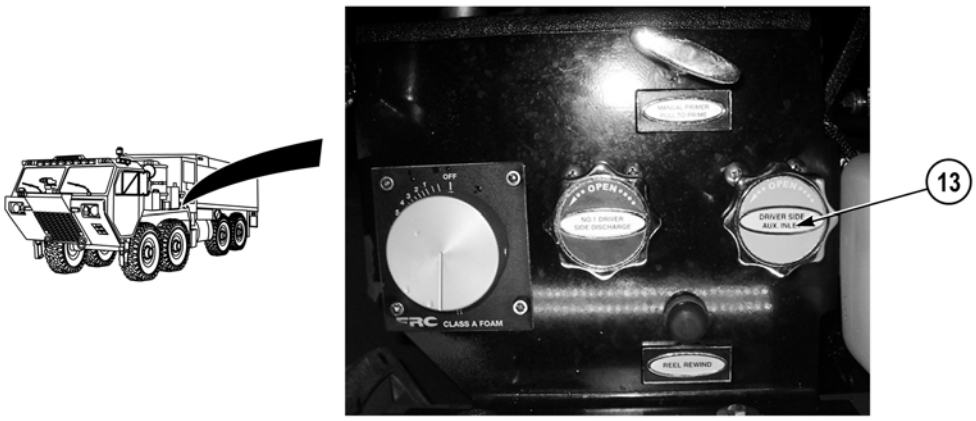
Monitor water level gauge while water tank is filling in freezing temperatures. Water tank overflow may cause slippery conditions on and around vehicle. Failure to comply may result in injury or death to personnel.

6. Monitor WATER LEVEL gauge (7) until full (F) light (8) illuminates.

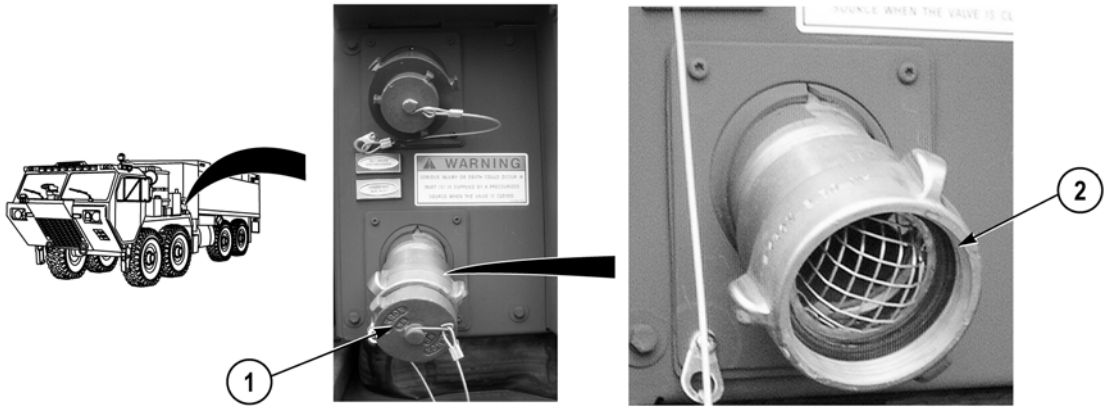
NOTE

Valve is completely closed when red indicator light illuminates.

7. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (9) until red indicator light (10) illuminates.
8. Close supply on positive water source.
9. Push DRIVER SIDE AUX. INLET valve control CLOSE button (11) until red indicator light (12) illuminates.



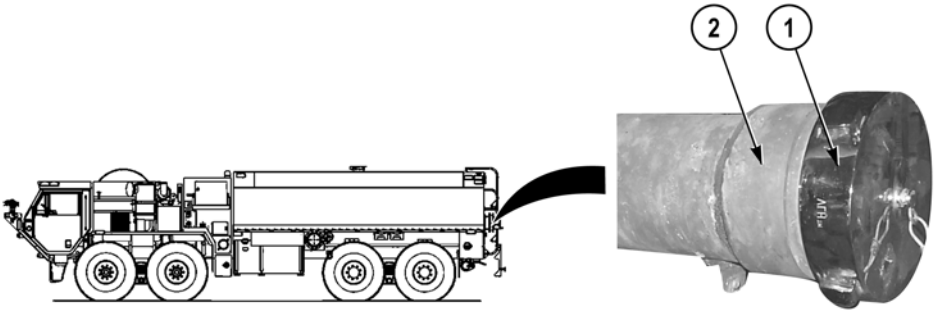
10. Open DRIVER SIDE AUX. INLET drain valve (13) to relieve pressure.
11. Close DRIVER SIDE AUX. INLET drain valve (13).



12. Disconnect 3 in. (7.6 cm) soft discharge hose from DRIVER SIDE AUX. INLET (2) and positive water source.
13. Install cap (1) on DRIVER SIDE AUX. INLET (2).

END OF TASK

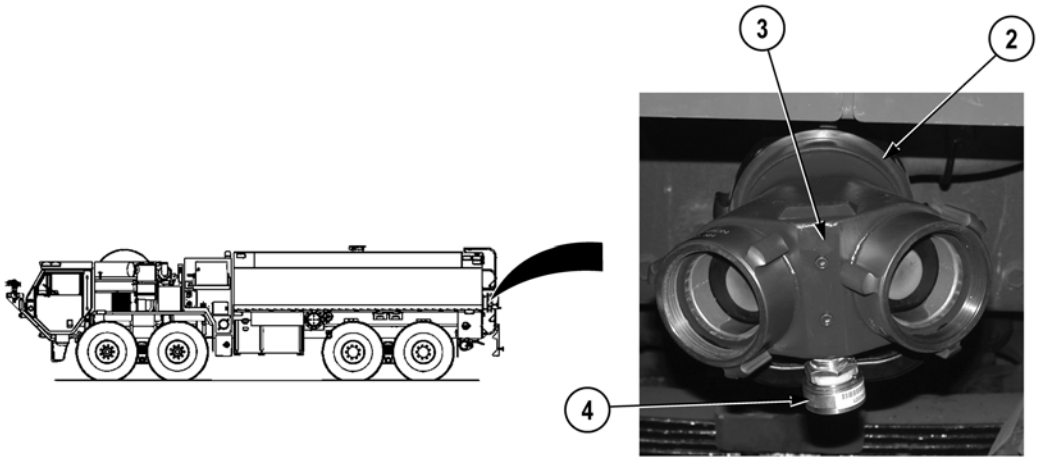
DIRECT TANK FILL



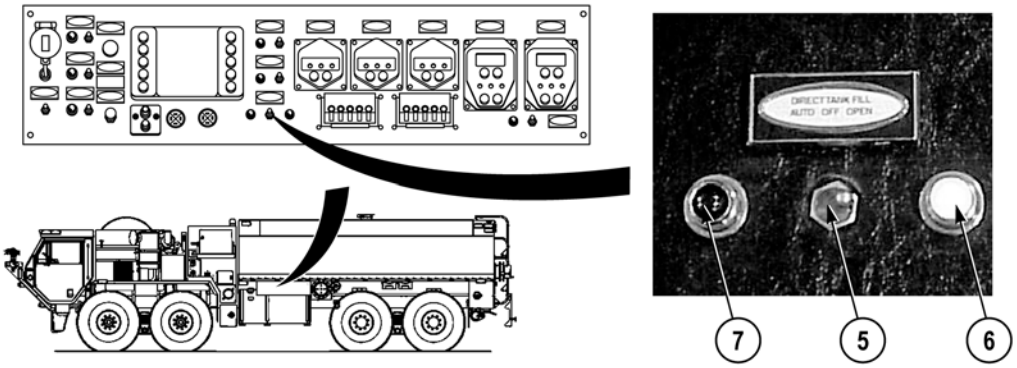
NOTE

Ensure vehicle is on level ground front to back and side to side before operating direct tank fill auto operation. Failure to comply may cause water tank to overfill.

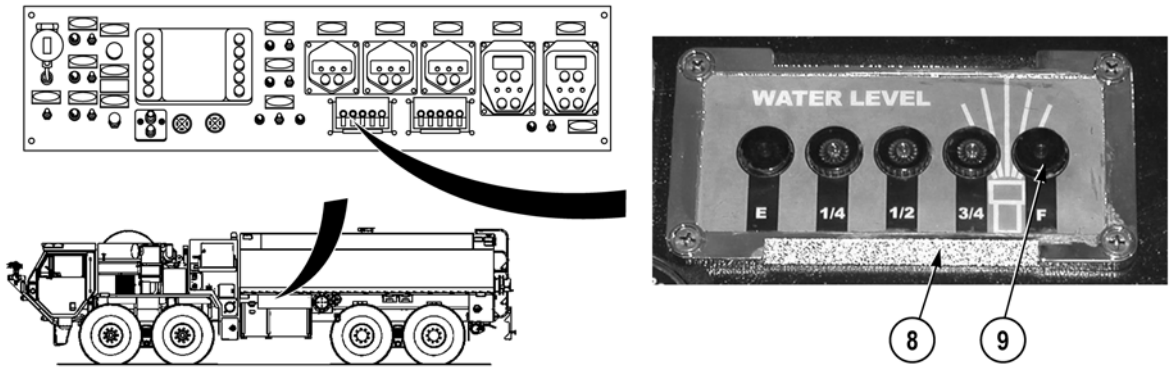
1. Remove cap (1) from direct tank fill inlet (2).



2. Install siamese fitting (3) on direct tank fill inlet (2).
3. Ensure bleeder valve (4) on siamese fitting (3) is in closed position.
4. Connect either one or two 3 in. (7.6 cm) soft discharge hoses to siamese fitting (3) and positive water source.
5. Open supply valve on positive water source.



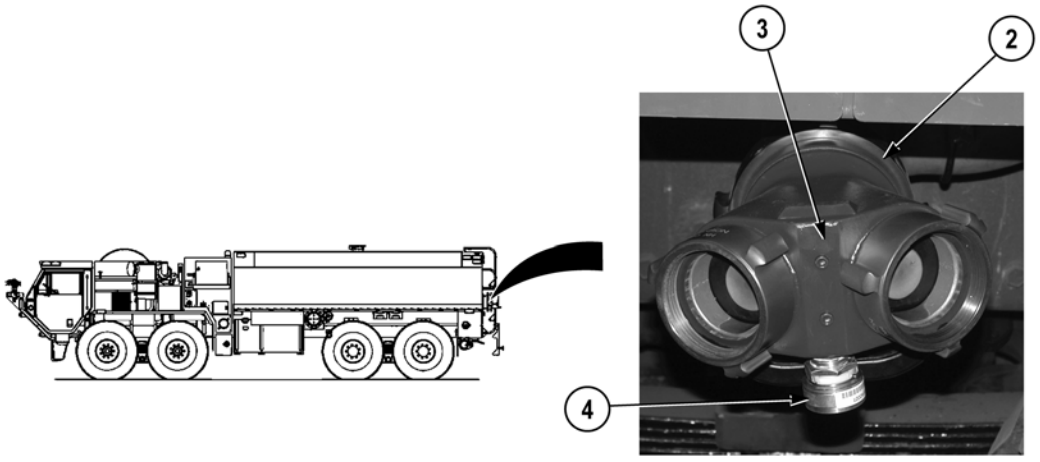
6. Put DIRECT TANK FILL switch (5) to AUTO position. Indicator lights (6) and (7) will illuminate.



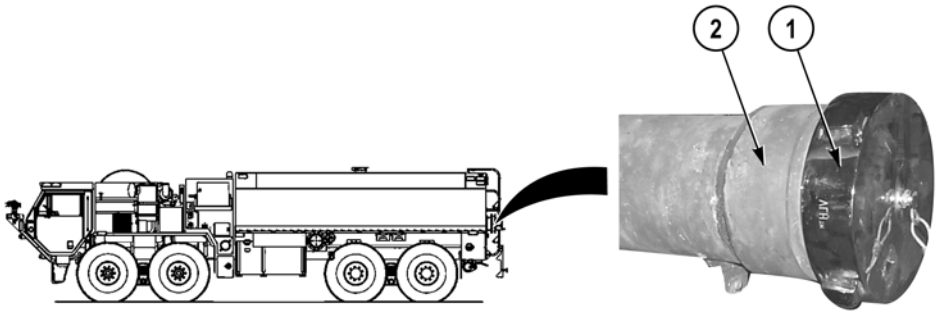
⚠ CAUTION

Monitor water level gauge when water tank is filling. Do not let water tank overflow. Failure to comply may result in damage to equipment.

7. Monitor water level gauge (8) until full (F) light (9) illuminates.
8. Indicator light (7) will go out.
9. Put DIRECT TANK FILL switch (5) to OFF position. Indicator light (6) will go out.
10. Close supply valve on positive water source.



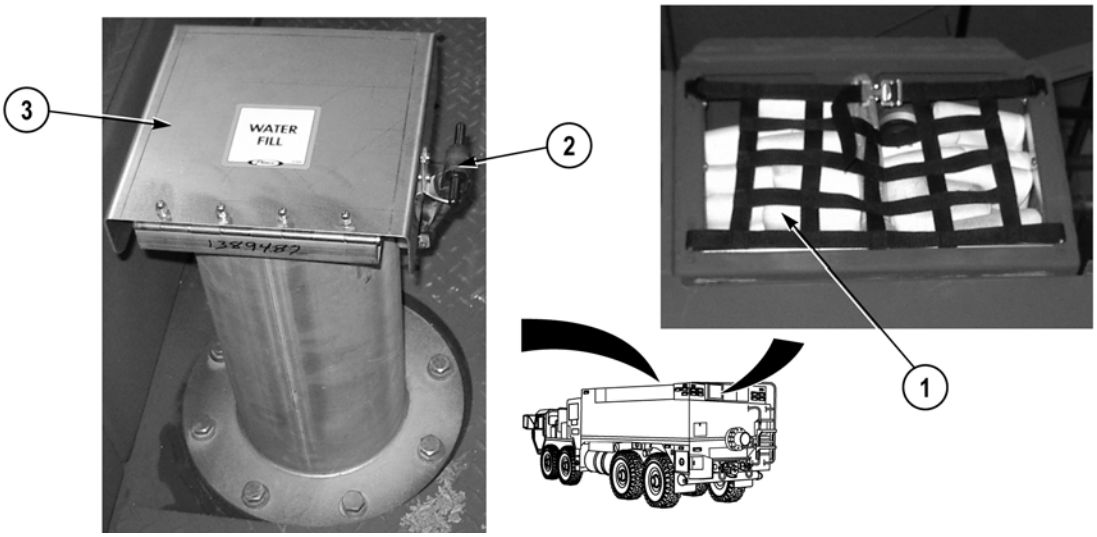
11. Slowly open siamese fitting bleeder valve (4) to relieve pressure.
12. Close siamese fitting bleeder valve (4).
13. Disconnect one or two 3 in. (7.6 cm) soft discharge hoses from siamese fitting (3).
14. Remove siamese fitting (3) from direct tank fill inlet (2) and stow.



15. Install cap (1) on direct tank fill inlet (2).

END OF TASK

OVERHEAD FILL



1. Connect soft discharge hose (1) to positive water source.
2. Unstow right rear access ladder (WP 0012).

WARNING

- **Use extreme care when walking on top of vehicle. Be extra careful in wet, icy, or muddy conditions. Failure to comply may result in personnel slipping and falling, causing injury or death to personnel.**
- **Ensure that an assistant has secure grip on water hose prior to opening valve on positive water source. Failure to comply may cause damage to equipment or death or injury to personnel.**

3. Release rubber hook (2) and open WATER FILL cover (3).
4. Open supply valve on water source and fill water tank.
5. Close supply valve on water source when water tank is full.
6. Close WATER FILL cover (3) and connect with rubber hook (2).
7. Disconnect soft discharge hose (1) from positive water source.
8. Stow right rear access ladder (WP 0012).

END OF TASK

FILLING FROM DRAFT

WARNING

When backing up vehicle, one crew member must be in back of vehicle operating rear step buzzer to communicate with driver. Failure to comply may result in injury or death to personnel and/or damage to equipment.

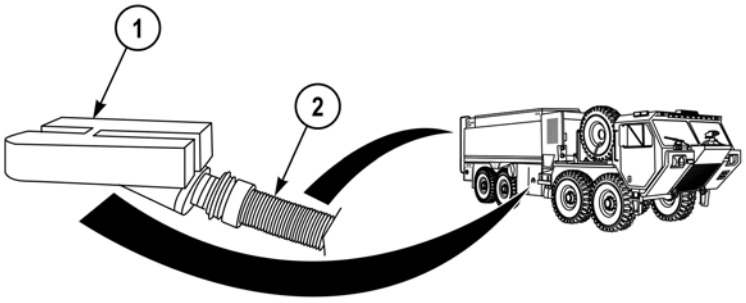
NOTE

- Pump performance is maximized with less than a 10 ft. (3 m) vertical lift. As vertical lift increases above 10 ft. (3 m), maximum pump capacity will be reduced. Altitude also affects pump performance.
- All valves, drains, and caps should be closed.

1. Position vehicle as close to water source as possible.
2. Park vehicle (TM 9-2320-279-10).

CAUTION

Ensure suction hose strainer is clean and free from debris and obstructions. Failure to comply may result in damage to equipment.

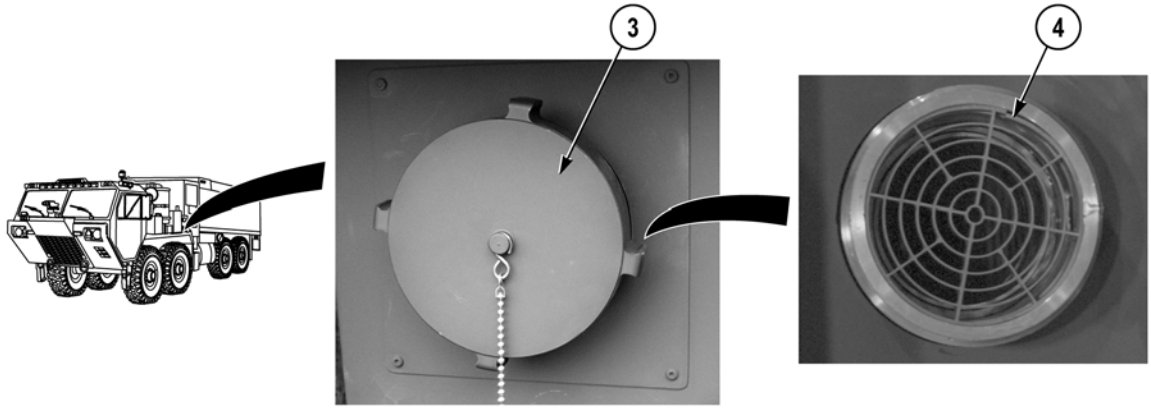


3. Remove suction hose strainer (1) and hard suction hose (2) from stowage compartments (WP 0039).

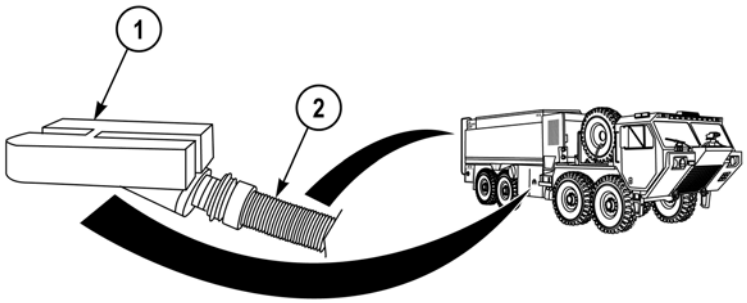
NOTE

- Ensure gaskets are present and free from damage prior to connecting hard suction hoses and suction hose strainer connections.
- Ensure all hard suction hose strainer connections are securely tightened.

4. Connect suction hose strainer (1) to hard suction hose (2).



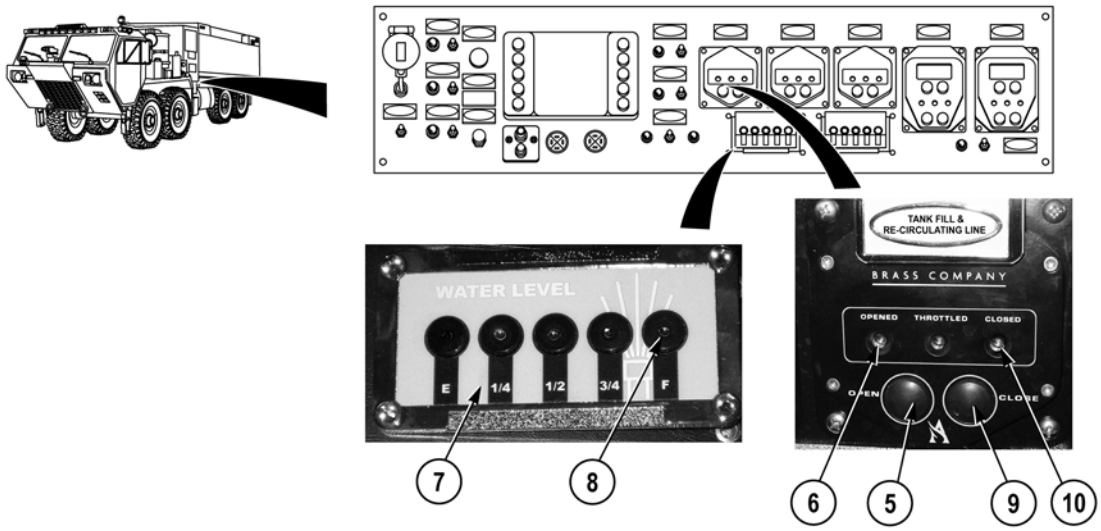
5. Remove cap (3) from driver side main inlet (4).
6. Connect hard suction hose (2) to driver side main inlet (4).



WARNING

Strainer must be positioned or suspended in water to prevent sucking of debris (sand, stones, mud, etc.). Strainer must be deep enough not to cause a whirlpool on surface of water. Failure to comply may result in injury or death to personnel and damage to equipment.

7. Position suction hose strainer (1) in water source.
8. Prime water pump (WP 0015).



NOTE

Valve is completely opened when green indicator light illuminates.

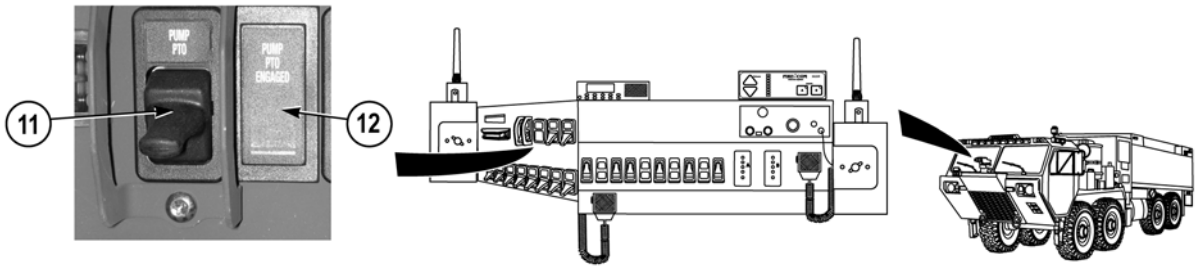
9. Push TANK FILL & RE-CIRCULATING LINE valve control OPEN button (5) until green indicator light (6) illuminates.

10. Monitor WATER LEVEL gauge (7) until full (F) light (8) illuminates.

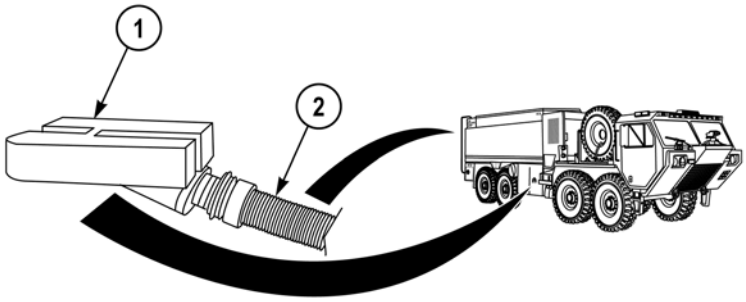
NOTE

Valve is completely closed when red indicator light illuminates.

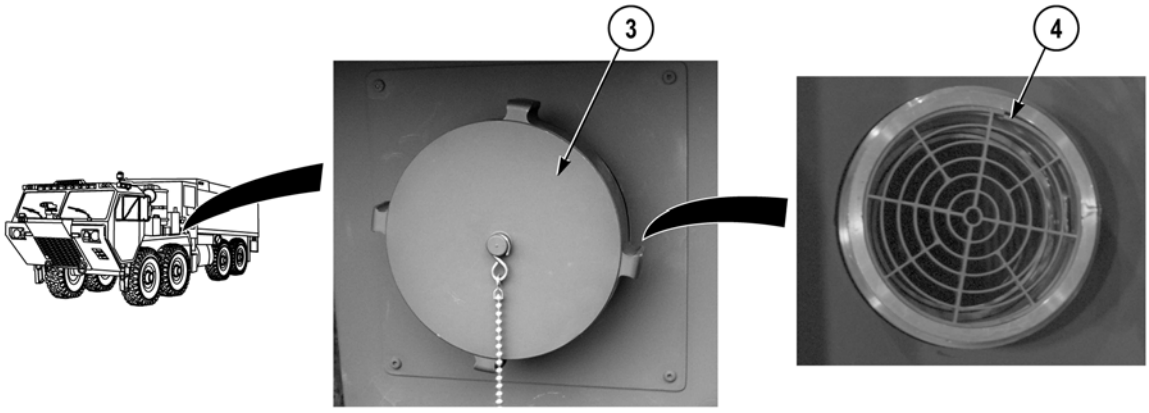
11. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (9) until red indicator light (10) illuminates.



12. Put PUMP PTO switch (11) to off position. Indicator light (12) will go out.



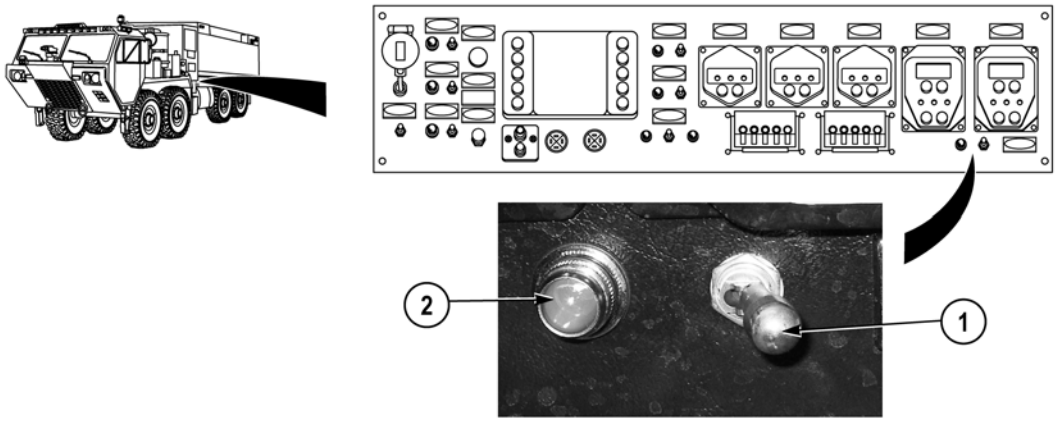
13. Remove suction hose strainer (1) from water source.
14. Disconnect suction hose strainer (1) from hard suction hose (2).



15. Disconnect hard suction hose (2) from driver side main inlet (4).
16. Install cap (3) on driver side main inlet (4).

END OF TASK

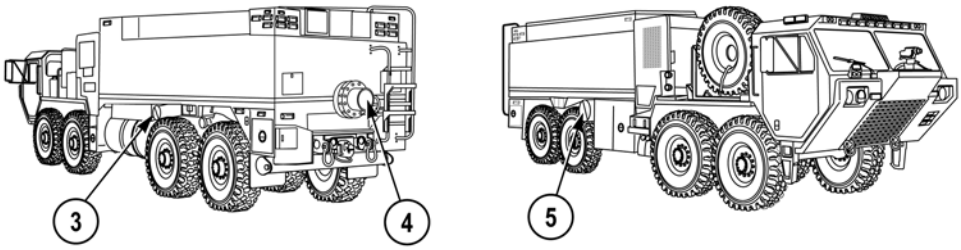
DRAINING WATER TANK



WARNING

- **Temperature must be above freezing if draining water tank while on a driving surface. Water could freeze on driving surface. Failure to comply may result in injury or death to personnel and/or damage to equipment.**
- **Ensure vehicle is parked in a location where personnel and other equipment will be protected from water spraying out of discharges and drains during draining and blowout procedures. Position vehicle so that it is level from side-to-side and level front-to-back. Failure to comply may cause damage to equipment and/or injury to personnel.**

1. Position vehicle in a suitable location to drain water tank.
2. Put WATER TANK DRAIN switch (1) to open position. Indicator light (2) will illuminate.
3. Allow water tank to drain.
4. Put WATER TANK DRAIN switch (1) to closed position. Indicator light (2) will go out.



NOTE

Perform Step (5) if water tank drain time needs to be decreased, or prior to performing pump and plumbing blowout procedures.

5. Open driver side (3), rear (4), and passenger side (5) manual bray dump valves.

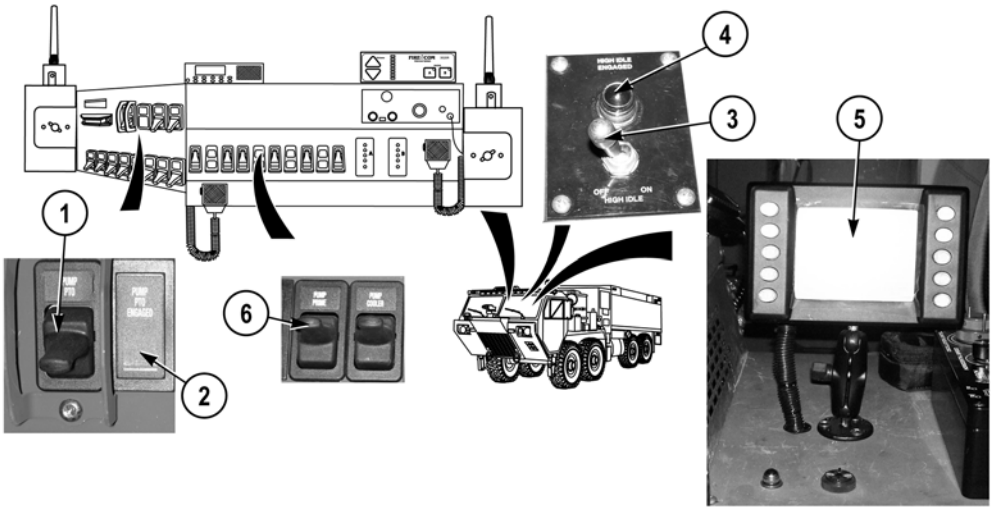
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PRIMING WATER PUMP

PRIMING WATER PUMP FROM CAB



NOTE

Ensure water source is available before performing pump priming function.

1. Prepare vehicle for required pumping operations.
2. Start engine (TM 9-2320-279-10).
3. Turn PUMP PTO switch (1) to on position. Indicator light (2) will illuminate.
4. Put HIGH IDLE switch (3) to ON position. Indicator light (4) will illuminate.
5. Enable cab pressure governor operation (WP 0016).
6. Set pressure governor (5) to operating pressure (WP 0016).

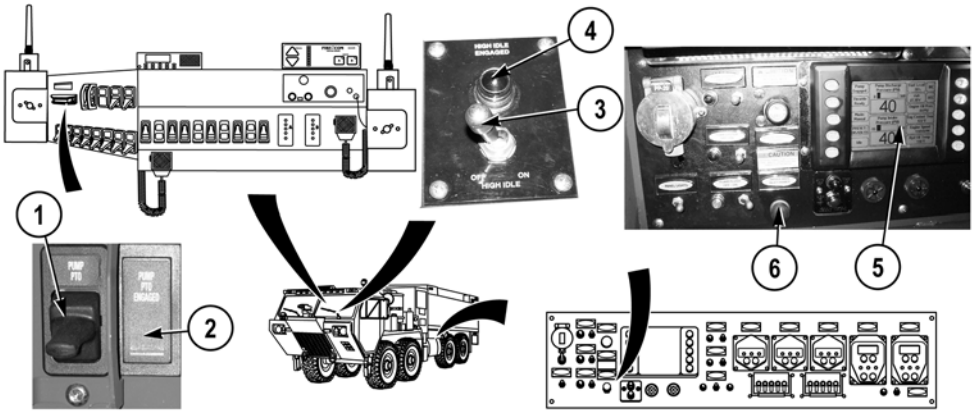
⚠ CAUTION

If discharge gauge reading does not increase, or priming pump does not discharge water to ground in 60 seconds, do not continue running priming pump. Stop water pump, or damage to equipment may result.

7. Push and hold PUMP PRIME switch (6) to on position.
8. Ensure pressure governor (5) displays water pressure on pump discharge display.
9. If pressure governor (5) displays water pressure, release PUMP PRIME switch (6) to off position.
10. Proceed with mission.

END OF TASK

PRIMING WATER PUMP FROM PUMP OPERATOR'S PANEL



NOTE

Ensure water source is available before performing pump priming function.

1. Start engine (TM 9-2320-279-10).

⚠ CAUTION

If discharge gauge reading does not increase, or priming pump does not discharge water to ground in 60 seconds, do not continue running priming pump. Stop water pump, or damage to equipment may result.

2. Turn PUMP PTO switch (1) to on position. Indicator light (2) will illuminate.
3. Put HIGH IDLE switch (3) to ON position. Indicator light (4) will illuminate.
4. Set pressure governor (5) to operating pressure (WP 0016).
5. Push and hold DRIVER MAIN INLET PRIMER button (6).
6. Ensure pressure governor (5) displays water pressure on pump discharge display.
7. If pressure governor (5) displays water pressure, release DRIVER MAIN INLET PRIMER button (6).
8. Proceed with mission.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PRESSURE GOVERNOR OPERATION (CAB AND PUMP OPERATOR'S PANEL)

PERSONNEL CAB DISPLAY

a. General Description.

The intent of this software design specification is to describe the functional requirements of the HEWATT cab display. The HEWATT cab display shall provide an interface to select and control the various components of the fire suppression system. The HEWATT cab display shall provide an interface that the operator will use to monitor and respond to various alarms, warnings, and advisories pertaining to the apparatus.

The control requirements will follow requirements outlined by the fire industry standard NFPA 1901, published in 2003 and NFPA 414, published in 2001.

The control system will be functional for all HEWATT custom chassis. Those chassis will be built using J1939 equipped engines and transmissions.

b. Applicable Documents.

1. **Document and Specification Precedence.**

   The following documents and/or publications form a part of this design specification as specified herein. In the event of conflict between the requirements of this design specification and referenced documents, the referenced specifications shall take precedence.

   Federal Government - National Fire Protection Agency:

   (a) NFPA 414 (2001) Standard for Aircraft Rescue and Fire-Fighting Vehicles (Quincy, MA)

   (b) NFPA 1901 (2003) Standard for Automotive Fire Apparatus (Quincy, MA)

2. **Electro-Mechanical Requirements.**

   The HEWATT cab display shall be capable of reading a transducer signal and driving a pump displacement solenoid. Various inputs and outputs will allow the system to perform independent or dependent operations based on user input.

c. Software Operation Requirements.

1. **System Initiation Requirements.**

   The HEWATT cab display will be powered from the battery disconnect switch located in the driver's area. The HEWATT cab display will initialize confirming all internal operations are operating properly and the controller ECU is receiving proper engine and transmission data. If issues are found during the initial power up sequence, system errors or warnings will be logged and the appropriate indicator lights will be activated on the Home screen. If no issues are found during the initialization process, no errors or warnings will be displayed and the system will continue to the Home screen.

2. **Software Operation.**

NOTE

Pressure governor display may take up to 20 minutes to operate in cold climate conditions.

(a) **Home Screen.** The Home screen for the HEWATT cab display shall look like Figure 1. Once the display is powered and initialization has finished, the display shall advance to the Home screen. The user will begin interfacing with the display from this screen. User options from this screen shall include:

- Mode selection
- Preset selection
- Idle selection
- Increase selection
- Decrease selection
- Menu selection

Indicator lights on the Home screen include:

- Pump Engaged light
- OK to Pump/OK to Pump and Roll

Auxiliary options with indicator lights on the Home screen include:

- View Warning event selection
- View Caution event selection
- Confirmation selection or “OK button”

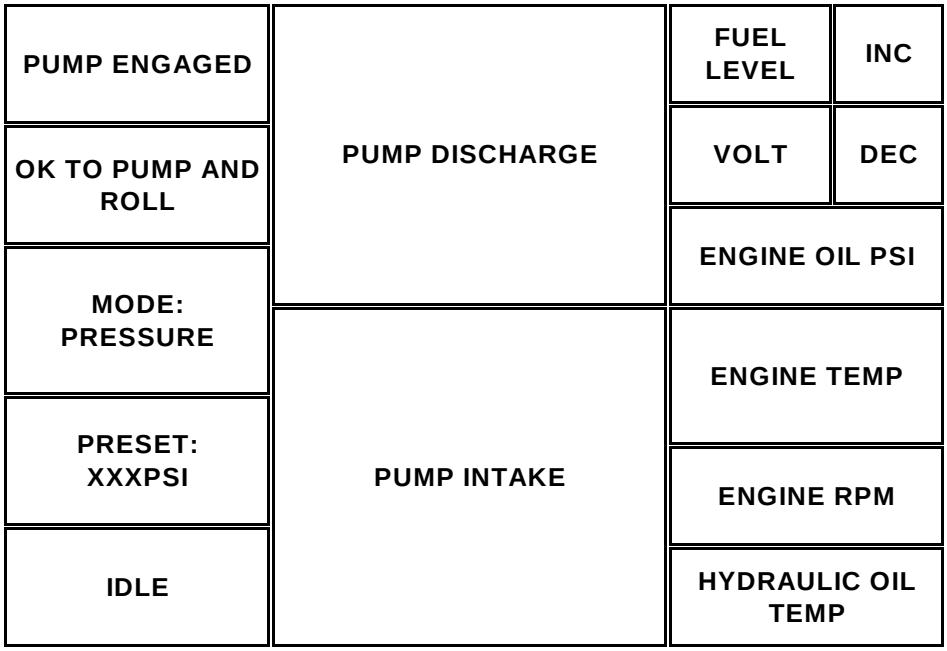


Figure 1. Home Screen for the HEWATT Cab Display.

(1) **Fuel Level.** The fuel level shall be displayed in a digital format ranging from 0% to 100%. The increments shall be in 5% increments or the minimum resolution possible. The fuel level shall initiate a warning light when the level is below 1/4 tank.

(2) **Voltmeter.** The voltmeter shall be displayed in a digital format ranging from 0 V to 32 V. The increments shall be in 1 V increments or the minimum resolution possible. The voltmeter shall initiate a warning light when the level is below 23.6 V and above 30 V for 20 seconds.

(3) **Engine Oil Pressure.** The engine oil pressure shall be displayed in a digital format ranging from 0 to 100 psi (0 to 689.5 kPa). The increments shall be in 1 psi (6.9 kPa) increments or the minimum resolution possible. The engine oil pressure shall initiate a warning light when the level is below 8.5 psi (58.6 kPa).

(4) **Engine Water Temperature.** The engine water temperature shall be displayed in a digital format ranging from 0°F to 320°F (-18°C to 160°C). The increments shall be in 1°F (0.55°C) increments or the minimum resolution possible. The engine water temperature shall initiate a warning light when the level is above 225°F (107°C).

(5) **Engine RPM.** The engine rpm shall be displayed in a digital format ranging from 0 rpm to 3500 rpm. The increments shall be in 1 rpm increments or the minimum resolution possible.

(6) **Hydraulic Oil Temperature.** The hydraulic oil temperature shall be displayed in a digital format ranging from -40°F to 200°F (-40°C to 93°C). The increments shall be in 1°F (0.55°C) increments or the minimum resolution possible. The hydraulic oil temperature shall initiate a caution light when the level is above 185°F (85°C).

(7) **Pump Discharge Gauge.** The pump discharge gauge shall be displayed in a digital format ranging from 0 to 300 psi (0 to 2069 kPa). A bar graph with hash marks every 50 psi (344.7 kPa) (starting from 0) shall also be provided for a “quick glance” reference for the user. The increments shall be in 1 psi (6 kPa) increments or the minimum resolution possible.

(8) **Pump Intake Gauge.** The pump intake gauge shall be displayed in a digital format ranging from -30 in. Hg (76.2 cm Hg) to 300 psi (2069 kPa). A bar graph with hash marks every 50 psi (344.7 kPa) (starting from 0) shall also be provided for a “quick glance” reference for the user. The increments shall be in 1 psi (6 kPa) increments or the minimum resolution possible.

(9) **Pump Engaged Indicator Light.** The “pump engaged” display light shall illuminate green once the following conditions have been satisfied:

- The vehicle PTO (Power Take Off) has been engaged.

(10) **OK TO PUMP/OK TO PUMP AND ROLL Indicator Light.** The “OK TO PUMP” shall be displayed and the display light illuminated green once the following conditions have been satisfied:

- The vehicle PTO has been engaged.
- The vehicle’s transmission is in neutral.
- The vehicle parking brake is activated.
- The vehicle’s high idle has been engaged.

If all conditions have been met except for the high idle, the text shall display “High idle not engaged” and the indicator will flash amber until high idle is engaged.

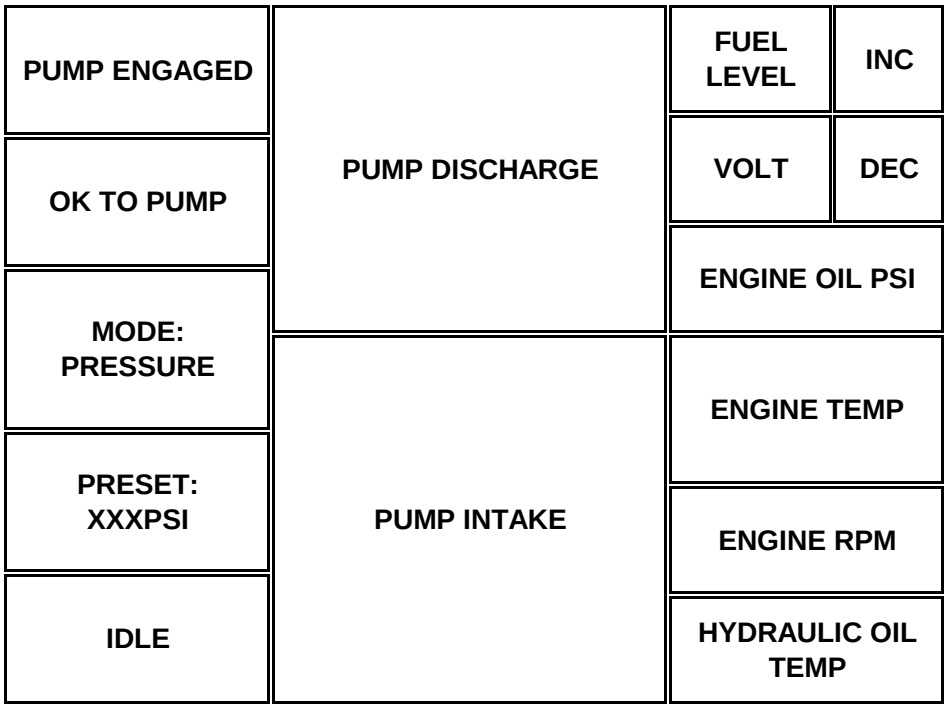


Figure 2. Home Screen When “OK TO PUMP” Interlocks Have Been Satisfied.

The “OK TO PUMP AND ROLL” shall be displayed and the display light illuminated green once the following conditions have been satisfied:

- The vehicle PTO has been engaged.
- The vehicle’s transmission is in gear.
- The vehicle parking brake is not activated.

(11) **Warning Event.** A warning event initiates when a critical system failure or limit has occurred. A critical system is defined as a part or system that may cause the fire apparatus to stop flowing water **immediately** if no action is taken. This event is logged in the diagnostics archive and causes the “Engine RPM” location on the Home screen to read “Warning!” accompanied by a flashing red indicator light on the display and an audible alarm. The OK light shall be illuminated green when scrolling through the warning screens. Once the user has scrolled through the warning screens, the display will return to the Home screen and the warning text should still be visible and illuminated red until the active warnings have disappeared.

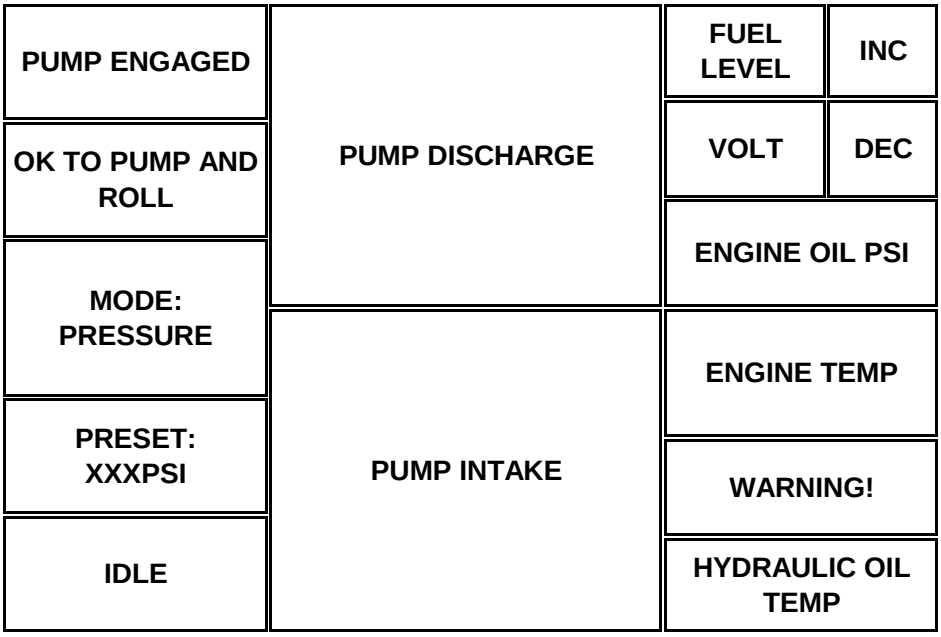


Figure 3. Home Screen When a Warning Event Occurs.

The user may press the flashing red indicator light to view a description of the event that has taken place. Critical system failures or limits that cause a warning event and their descriptive screens are as follows:

- Pump displacement solenoid failure with an open circuit detected.
- Pump displacement solenoid failure with a short circuit.
- Controller ECU communication loss.
- Hydraulic oil level is at a critical level.
- Engine oil level is at a critical level.
- Engine water temperature is at a critical level.
- System voltage is at a critical level.
- Fuel level is at a critical level (under 1/4 tank).

If more than one warning has been issued, the user must view and acknowledge each one before the Home screen may be viewed again. If a warning event and caution event occurs at the same instance, the Home screen display indicator shall flash red instead of amber for sense of priority. The user shall view the warning events before viewing the caution events.

(12) **Caution Event.** A caution event initiates when a non-critical system failure or limit has occurred. A non-critical system is defined as a part or system that may cause the fire apparatus to stop flowing water **eventually** if no action is taken. This event is logged in the diagnostics archive and causes the “Engine RPM” location on the Home screen to read “Caution!” accompanied by a flashing amber indicator light on the display and an audible alarm. The OK light shall be illuminated green when scrolling through the caution screens. Once the user has scrolled through the caution screens, the display will return to the Home screen and the caution text should still be visible and illuminated red until the active cautions have disappeared.

<table>
<tr><td>PUMP ENGAGED</td><td rowspan="2">PUMP DISCHARGE</td><td>FUEL LEVEL</td><td>INC</td></tr>
<tr><td rowspan="2">OK TO PUMP AND ROLL</td><td>VOLT</td><td>DEC</td></tr>
<tr><td rowspan="2">MODE: PRESSURE</td><td colspan="2">ENGINE OIL PSI</td></tr>
<tr><td rowspan="3">PUMP INTAKE</td><td colspan="2">ENGINE TEMP</td></tr>
<tr><td>PRESET: XXXPSI</td><td colspan="2">CAUTION!</td></tr>
<tr><td>IDLE</td><td colspan="2">HYDRAULIC OIL TEMP</td></tr>
</table>

Figure 4. Home Screen When a Caution Event Occurs.

The user may press the flashing amber indicator light to view a description of the event that has taken place. Non-critical system failures or limits that cause a caution event and their descriptive screens are as follows:

- Pump discharge transducer failure with an open circuit detected.
- Pump discharge transducer failure with a short circuit detected.
- Pump intake pressure transducer failure with an open circuit detected.
- Pump intake pressure transducer failure with a short circuit detected.
- Pump intake vacuum transducer failure with an open circuit detected.
- Pump intake vacuum transducer failure with a short circuit detected.
- Hydraulic oil temperature is at a critical level.
- Engine rpm is at a critical level.

If more than one caution has been issued, the user must view and acknowledge each one before the Home screen may be viewed again. If a warning event and caution event occurs at the same instance, the Home screen shall flash red instead of amber for sense of priority. The user shall view the warning events before viewing the caution events.

(13) **Confirmation Selection or "OK Button".** The user may select an option or command that requires a confirmation step before proceeding with the command. In the event of a confirmation request, a pop-up will appear on the screen asking the user if it is OK to proceed with that command. The "OK" button on the display shall illuminate green during this time until 3 seconds have passed or the user has accepted the confirmation by pressing it.

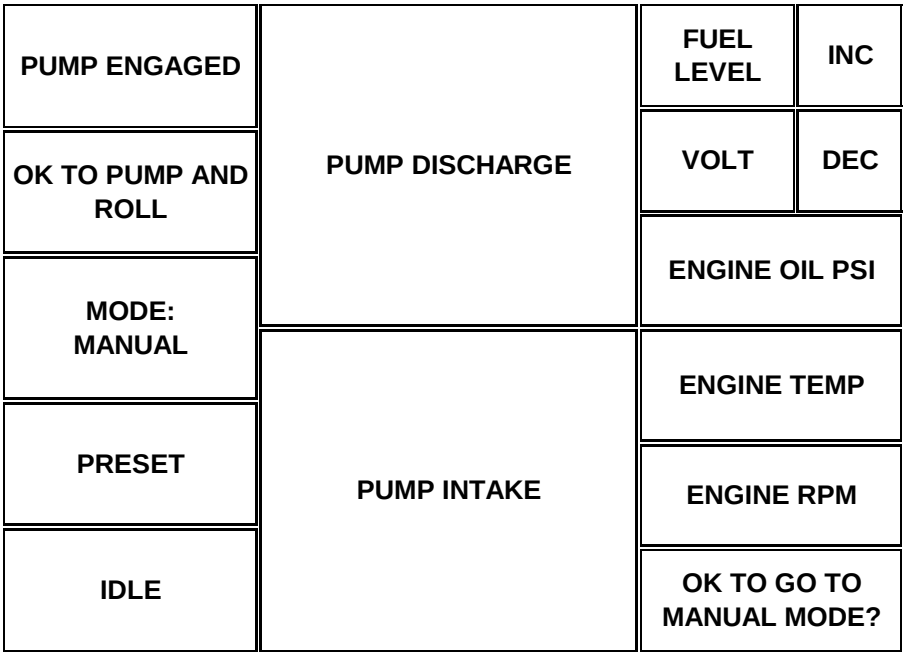


Figure 5. An Example of the Home Screen When a Confirmation "OK" Message Appears.

(14) **Mode Selection.** The mode button allows the user to toggle between pressure mode and manual mode. In pressure mode, the controller ECU receives feedback from the intake and discharge transducers and adjusts the pump displacement solenoid to match the desired pressure inputted by the user. In manual mode, the controller ECU adjusts the pump displacement solenoid with feedback from the system only when available.

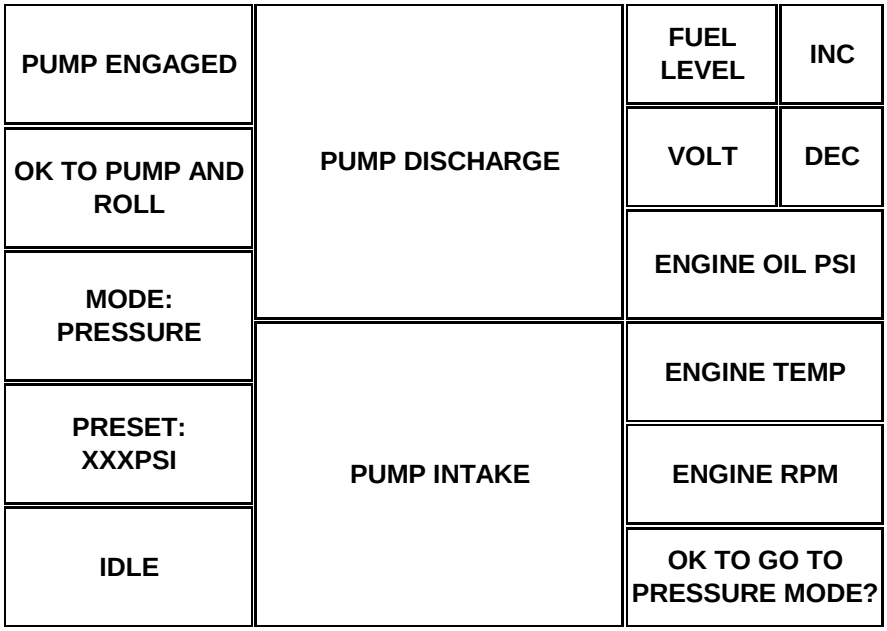


Figure 6. The Home Screen Once the Mode Button Is Pushed To Go Into Pressure Mode.

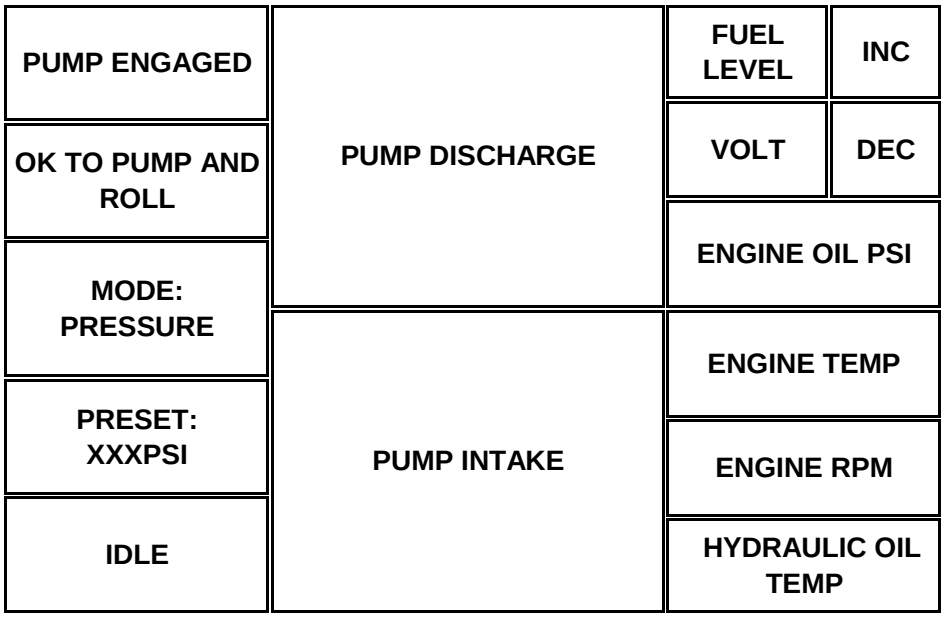


Figure 7. The Home Screen Once the User Presses the OK Button Within 3 Seconds To Go To Pressure Mode.

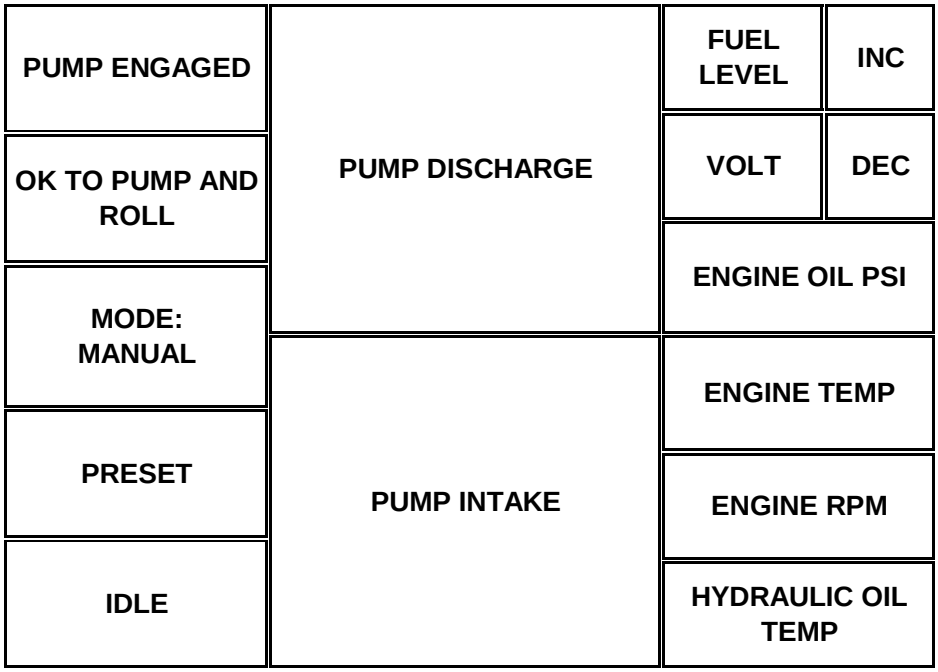


Figure 8. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To Pressure Mode.

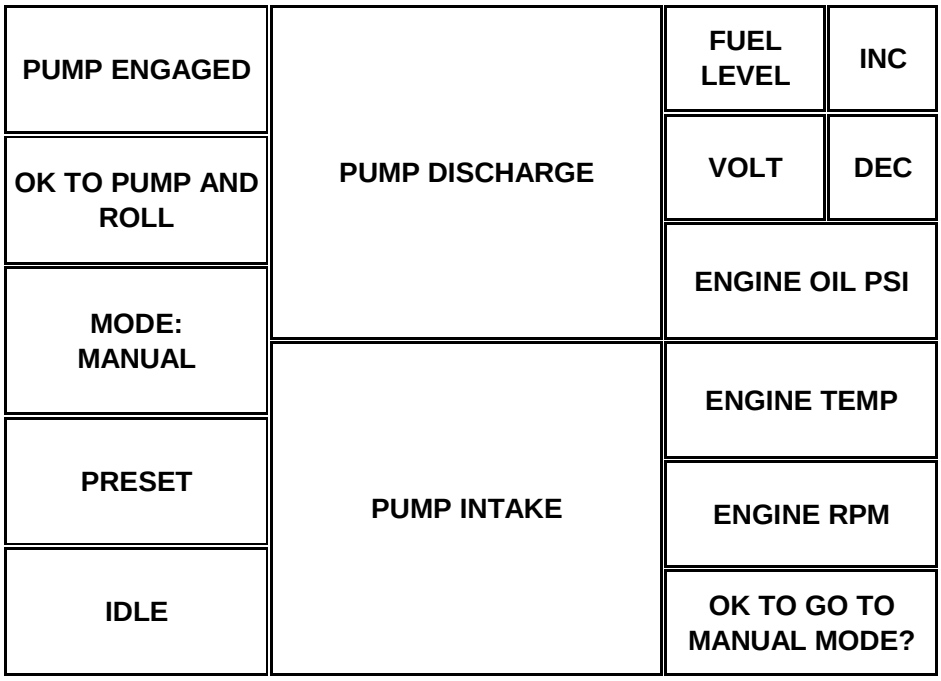


Figure 9. The Home Screen Once the Mode Button Is Pushed To Go Into Manual Mode.

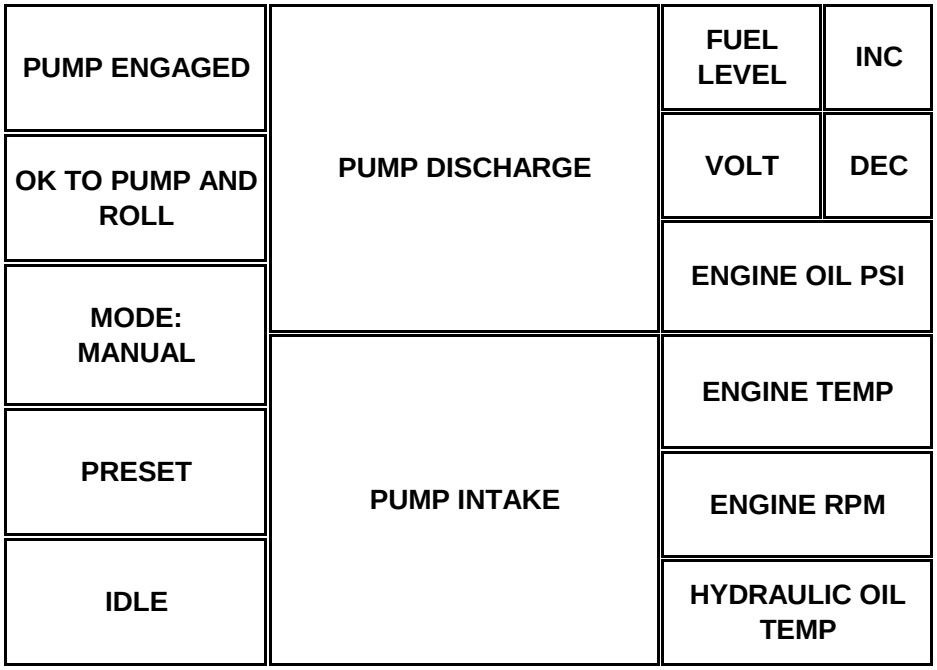


Figure 10. The Home Screen Once the User Presses the OK Button Within 3 Seconds To Go To Manual Mode With the Pressure On the Pump Under 10 psi (68.9 kPa).

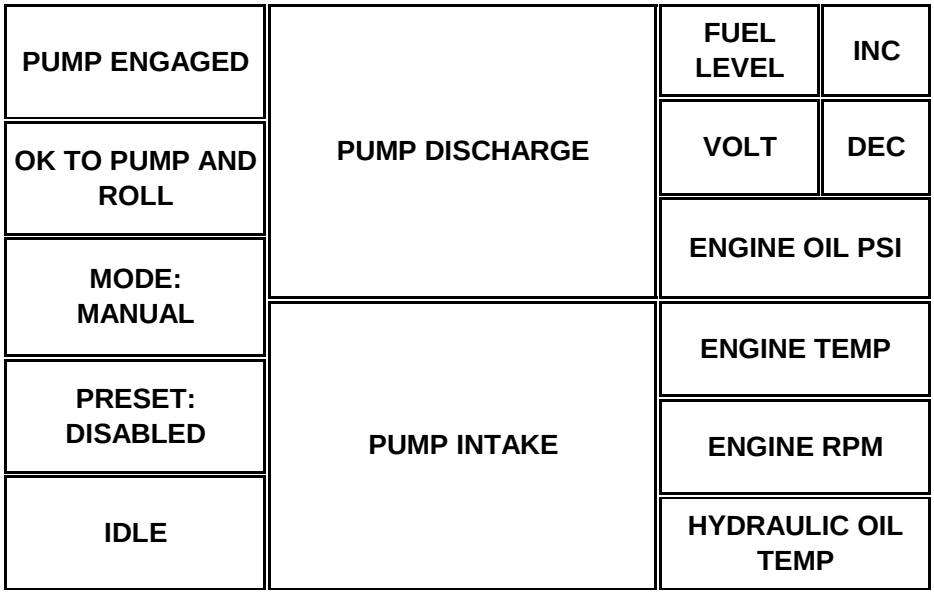


Figure 11. The Home Screen Once the User Presses the OK Button Within 3 Seconds To Go To Manual Mode With the Pressure On the Pump Over 10 psi (68.9 kPa).

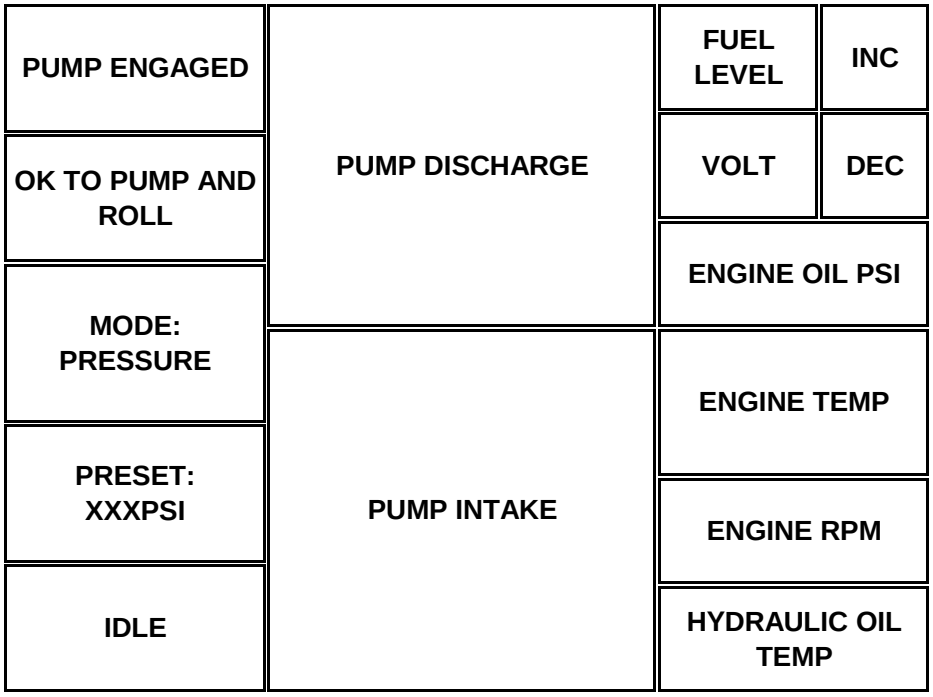


Figure 12. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To Manual Mode.

(15) **Preset Selection.** The preset button allows the user to command the pressure governor to automatically set itself to a predetermined pressure setting or pump displacement solenoid position.

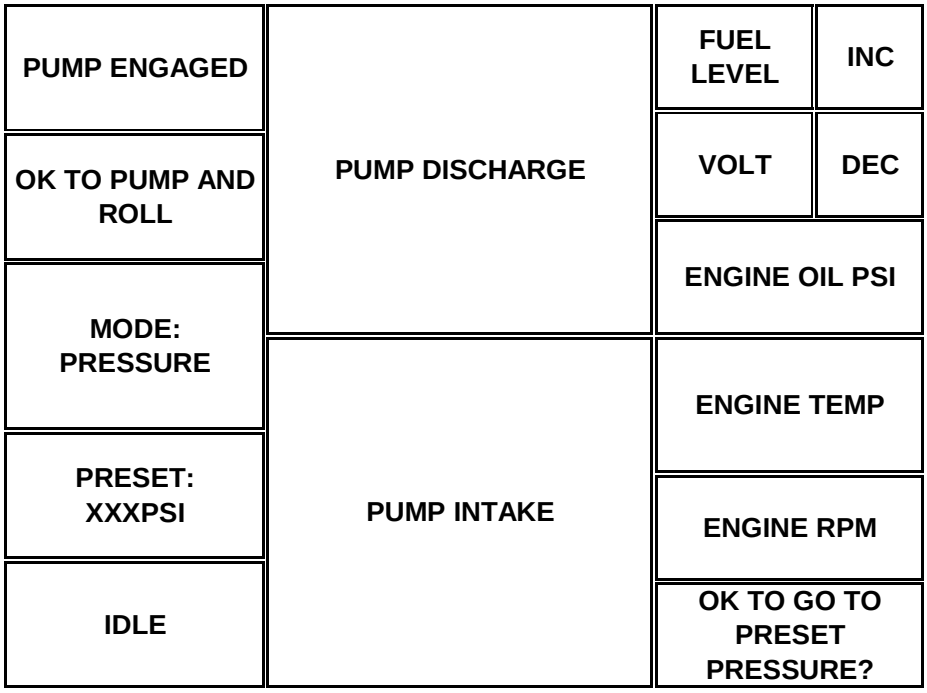


Figure 13. The Home Screen Once the Preset Button Is Pushed To Go To a Preset Pressure.

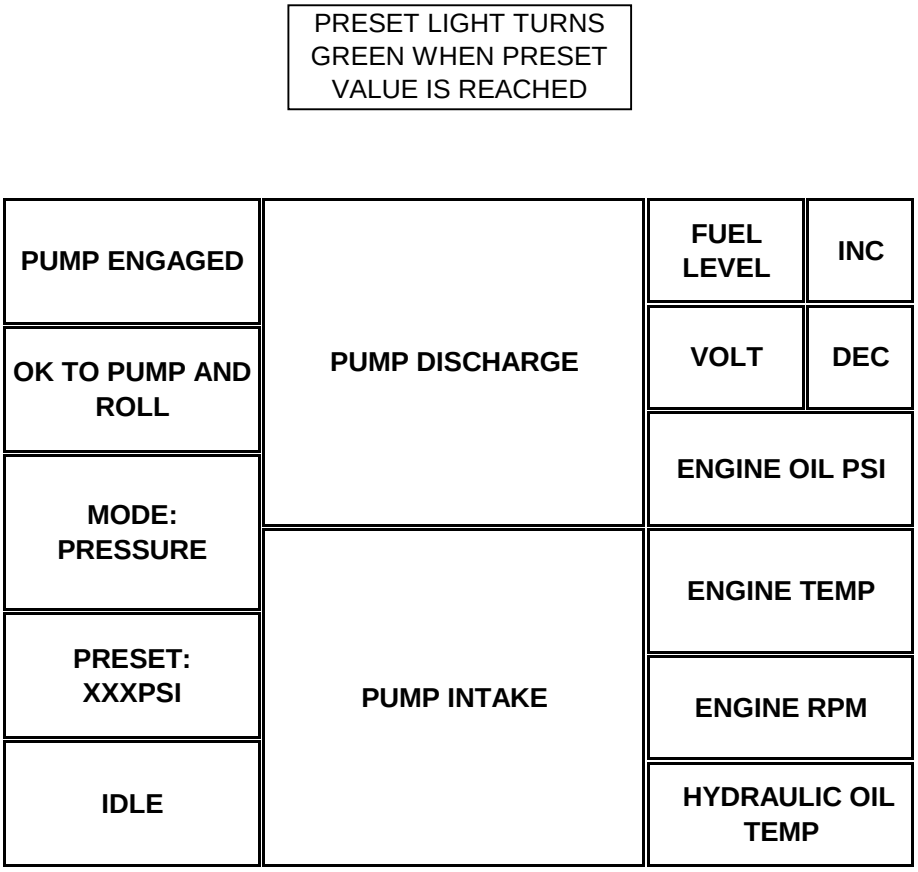


Figure 14. The Home Screen Once the Preset Pressure Value Is Reached.

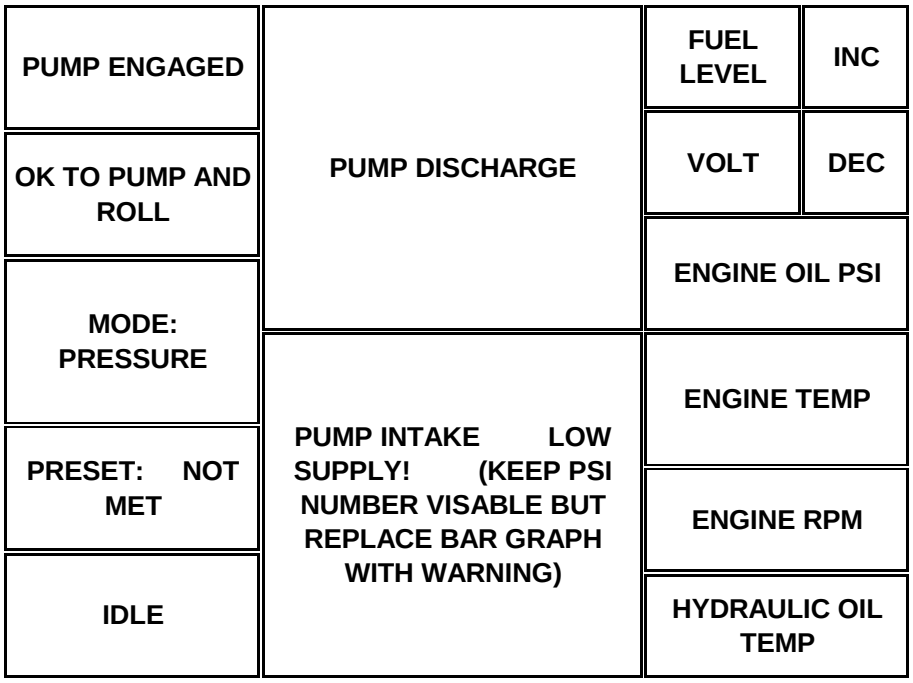


Figure 15. The Home Screen If the Preset Pressure Cannot Be Reached and the Engine RPM Is Above 1200.

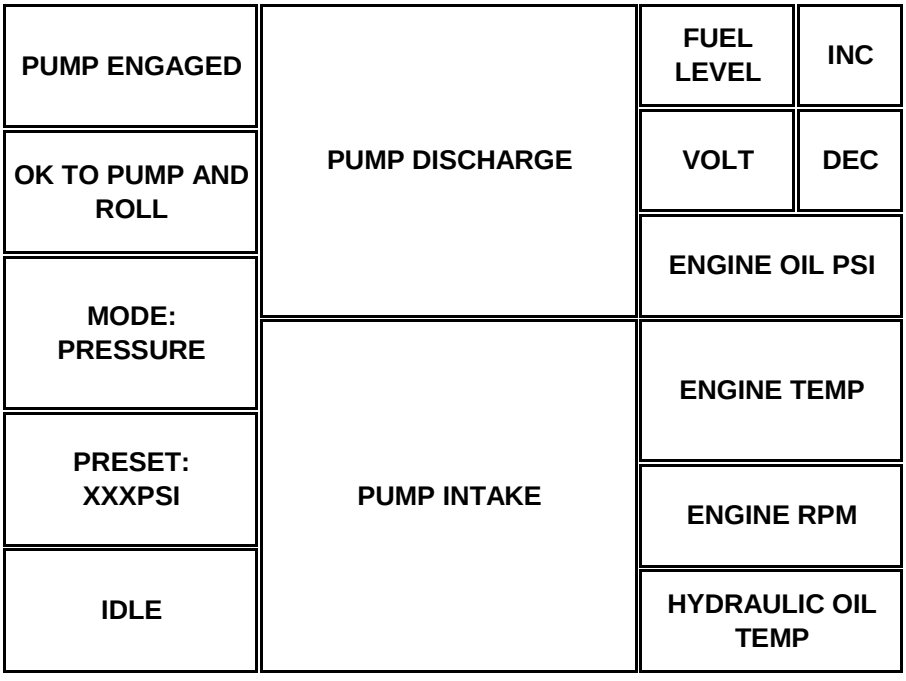


Figure 16. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To a Preset Pressure.

(16) **Idle Selection.** The idle button allows the user to stop the flow of water and return the pump to a neutral state.

PUMP ENGAGED	PUMP DISCHARGE	FUEL LEVEL	INC
OK TO PUMP AND ROLL		VOLT	DEC
MODE: PRESSURE		ENGINE OIL PSI	
PRESET: XXXPSI	PUMP INTAKE	ENGINE TEMP	
IDLE		ENGINE RPM	
		OK TO GO TO IDLE MODE?	

Figure 17. The Home Screen Once the Idle Button Is Pushed To Go To Idle Mode.

PUMP ENGAGED	PUMP DISCHARGE	FUEL LEVEL	INC
OK TO PUMP AND ROLL		VOLT	DEC
MODE: PRESSURE		ENGINE OIL PSI	
PRESET: XXXPSI	PUMP INTAKE	ENGINE TEMP	
IDLE		ENGINE RPM	
		HYDRAULIC OIL TEMP	

Figure 18. The Home Screen If the User Presses the OK Button Within 3 Seconds To Go To Idle Mode.

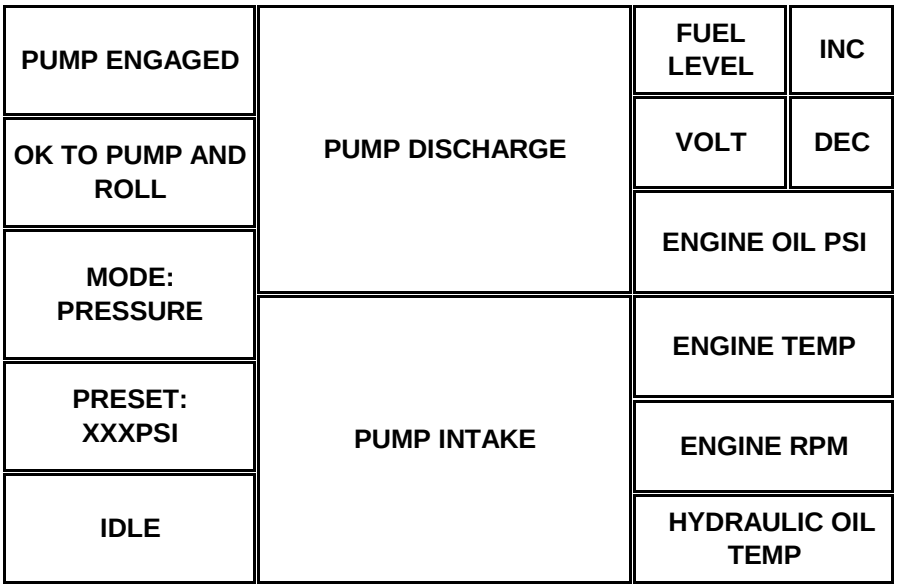


Figure 19. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To Idle Mode.

(17) **Increase Selection.** The increase button allows the user to adjust the output of water flow manually. If the system is in pressure mode, the user may increase the pressure in 3 psi (20.7 kPa) increments for every button push or 75 psi (517 kPa) for every button hold. If the system is in manual mode, the user may increase the pump displacement solenoid output by 1% for every button push or 25% for every button hold.

(18) **Decrease Selection.** The decrease button allows the user to adjust the output of water flow manually. If the system is in pressure mode, the user may decrease the pressure in 3 psi (20.7 kPa) increments for every button push or the minimum pressure for a button hold. If the system is in manual mode, the user may decrease the pump displacement solenoid output by 1% for every button push or down to 0% displacement for a button.

(19) **Menu Selection.** The menu button allows the user to access auxiliary functions of the pressure governor system. These auxiliary functions include:

- Display Enable
- Settings
- Diagnostics
- Calibrations
- SVC Mode Password
- Change SVC Mode Password

(b) **Display Enable.** The display enable function allows the user to take control of the pressure governor from a specific display location. Only one display location will be active at a time. The user will need to confirm a display enable action.

The display enable function screen shall look like Figure 20:

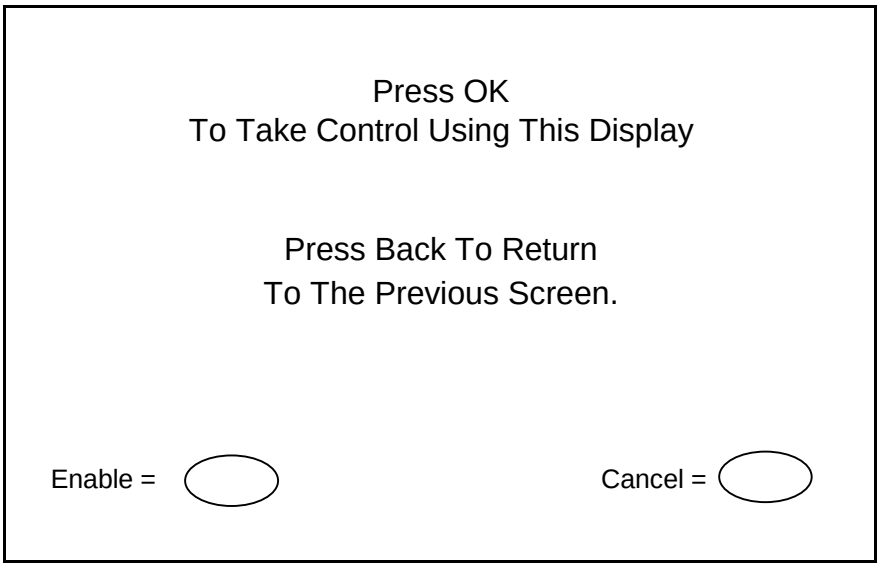


Figure 20. The Display Enable Screen.

(c) **Settings.** The settings function allows the user to access hardware and software settings for the system. The settings function is broken down into the following sections:

- Display Settings
- Configuration

Display settings control the appearance of the display. It may be accessed by any user and will not require password protection. The display settings shall accommodate the following setting changes:

- Units - The user may choose to view all units in English (default) or Metric.
- Contrast - The user may adjust the contrast of the screen ranging from 0% to 100% contrast. A contrast of 50% is default.
- Brightness - The user may adjust the brightness of the screen ranging from 0% to 100% brightness. A brightness of 50% is default.
- Backlighting - The user may choose to have the backlighting turned on (default) or off.

Configuration controls the presets of the pressure governor as well as button press durations. It may be accessed by any user and will not require password protection. The configuration menu shall accommodate the following setting changes:

- Buzzer Duration - The user may choose a continuous, one second, two second, or five second (default) buzzer duration upon an event that initiates an audible alarm.
- Button Hold - The user may choose a one second (default), two second, or five second button hold duration upon an event that requires a button hold.
- Preset Pressure - The user may set a preset pressure ranging from 0 to 300 psi (0 to 2069 kPa). A preset pressure of 150 psi (1034 kPa) is default. The user must confirm a change in the preset pressure if changed.
- Preset Output - The user may set a preset output to the pump displacement solenoid ranging from 0% to 60%. A preset output of 50% is default. The user must confirm a change in the preset output if changed.

(d) **Diagnostics.** The diagnostics function allows the user to view a detailed listing of the errors that have occurred with the system. The errors shall be logged for 255 engine starts from the first occurrence before being removed from the list. It may be accessed by any user and will not require password protection. The diagnostics screen shall list the following information:

- Mid - This ID code shall display the source of the error (ECU, cab display, pump panel display).
- Code - This code shall list a 4-digit component identifier code that will identify what part or system has failed. It should also include a 1-digit failure code that explains how it failed (short, open, etc.). These codes shall be listed together and separated by a dash (ex: XXXX-X).
- Occurrences - This shall list the number of times this error has occurred.
- First - This shall list the initial time, based on a time scale, of when the error first occurred.
- Last - This shall list the final time, based on a time scale, of when the error last occurred.
- Active - This shall list if the error is still active. An “X” will be used to define an active error and a “-“ will be used for a non-active error.

The user shall have the ability to scroll through the error code list, activate the OK button on a highlighted error code and view a detailed description of that error code.

(e) **Calibrations.** The calibrations function may only be accessed if the service password has been entered.

The calibrations function allows the user to adjust the software-coded variables that control the sensitivity of the system. The calibrations screen shall have the following variable changing abilities:

- min - The user may adjust the minimum current sent to the pump displacement solenoid.
- max - The user may adjust the maximum current sent to the pump displacement solenoid.
- Proportional - The user may adjust the proportional variable of the PID loop gain.
- Integral - The user may adjust the integral variable of the PID loop gain.
- Differential - The user may adjust the differential variable of the PID loop gain.

(f) **SVC Mode Password.** The service mode password function will allow the user to access password protected screens by inputting the correct 5-digit code.

(g) **Change Password.** The change password function may only be accessed if the service password has been entered.

The change password function shall allow the user to change the 5-digit code that grants access to password protected screens.

d. Input Specification and Requirements.

1. **Inputs.**

(a) **System Voltage.**

(b) **Engine Oil Pressure.**

(c) **Engine Water Temperature.**

(d) **Engine RPM.**

(e) **Display Data.**

(f) **Fuel Level (Analog).**

(g) **Hydraulic Oil Temperature (Analog).**

(h) **Pump Intake Pressure (Analog).**

(i) **Pump Discharge Pressure (Analog).**

(j) **Hydraulic Oil Level Low (Digital).**

2. **Outputs.**

(a) **Pump Displacement Solenoid: (Hardwire).**

(b) **Audio Alarm: (Hardwire).**

END OF TASK

PUMP OPERATOR'S PANEL DISPLAY

a. General Description.

The intent of this software design specification is to describe the functional requirements of the HEWATT pump panel display. The HEWATT pump panel display shall provide an interface to select and control the various components of the fire suppression system. The HEWATT pump panel display shall provide an interface that the operator will use to monitor and respond to various alarms, warnings, and advisories pertaining to the apparatus.

The control requirements will follow requirements outlined by the fire industry standard NFPA 1901, published in 2003; and, NFPA 414, published in 2001.

The control system will be functional for all HEWATT custom chassis. Those chassis will be built using J1939 equipped engines and transmissions.

b. Applicable Documents.

1. **Document and Specification Precedence.**

The following documents and/or publications form a part of this design specification as specified herein. In the event of conflict between the requirements of this design specification and referenced documents, the referenced specifications shall take precedence.

Federal Government - National Fire Protection Agency:

(a) NFPA 414 (2001) Standard for Aircraft Rescue and Fire-Fighting Vehicles (Quincy, MA)

(b) NFPA 1901 (2003) Standard for Automotive Fire Apparatus (Quincy, MA)

2. **Electro-Mechanical Requirements.**

The HEWATT pump panel display shall be capable of reading a transducer signal and driving a pump displacement solenoid. Various inputs and outputs will allow the system to perform independent or dependent operations based on user input.

c. Software Operation Requirements.

1. **System Initiation Requirements.**

The HEWATT pump panel display will be powered from the battery disconnect switch located in the driver's area. The HEWATT pump panel display will initialize confirming all internal operations are operating properly and the controller ECU is receiving proper engine and transmission data. If issues are found during the initial power up sequence, system errors or warnings will be logged and the appropriate indicator lights will be activated on the Home screen. If no issues are found during the initialization process, no errors or warnings will be displayed and the system will continue to the Home screen.

2. **Software Operation.**

NOTE

Pressure governor display may take up to 20 minutes to operate in cold climate conditions.

(a) **Home Screen.** The Home screen for the HEWATT pump panel display shall look like Figure 21. Once the display is powered and initialization has finished, the display shall advance to the Home screen. The user will begin interfacing with the display from this screen. User options from this screen shall include:

- Mode selection
- Preset selection
- Idle selection
- Increase selection
- Decrease selection
- Menu selection

Indicator lights on the Home screen include:

- Pump Engaged light
- Throttle Ready light

Auxiliary options with indicator lights on the Home screen include:

- View Warning event selection
- View Caution event selection
- Confirmation selection or “OK button”

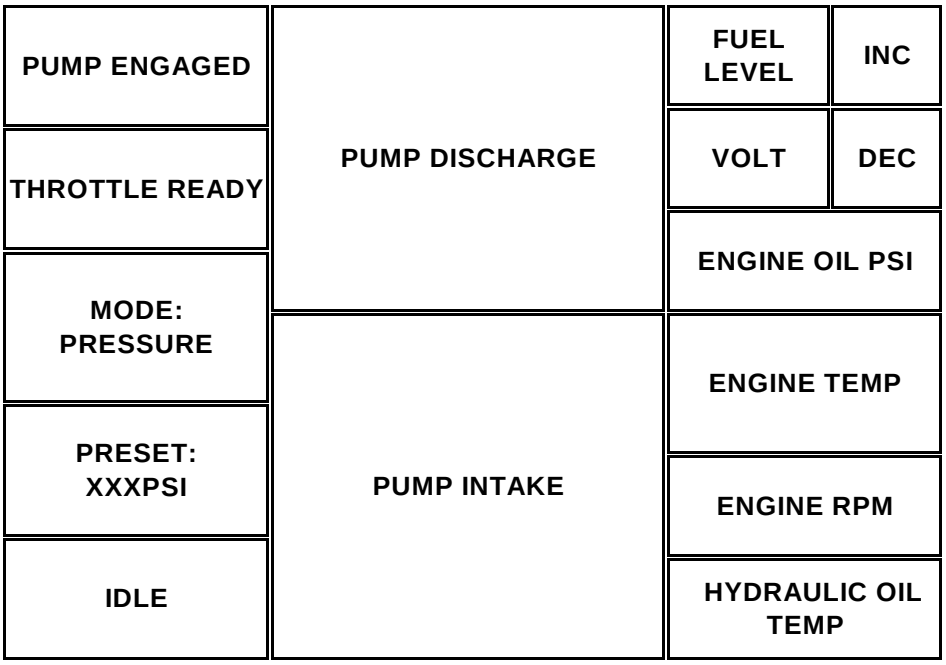


Figure 21. Home Screen for the HEWATT Pump Panel Display.

(1) **Fuel Level.** The fuel level shall be displayed in a digital format ranging from 0% to 100%. The increments shall be in 5% increments or the minimum resolution possible. The fuel level shall initiate a warning light when the level is below 1/4 tank.

(2) **Voltmeter.** The voltmeter shall be displayed in a digital format ranging from 0 V to 32 V. The increments shall be in 1 V increments or the minimum resolution possible. The voltmeter shall initiate a warning light when the level is below 23.6 V and above 30 V for 20 seconds.

(3) **Engine Oil Pressure.** The engine oil pressure shall be displayed in a digital format ranging from 0 to 100 psi (0 to 689.5 kPa). The increments shall be in 1 psi (6.9 kPa) increments or the minimum resolution possible. The engine oil pressure shall initiate a warning light when the level is below 8.5 psi (58.6 kPa).

(4) **Engine Water Temperature.** The engine water temperature shall be displayed in a digital format ranging from 0°F to 320°F (-18°C to 160°C). The increments shall be in 1°F (0.55°C) increments or the minimum resolution possible. The engine water temperature shall initiate a warning light when the level is above 225°F (107°C).

(5) **Engine RPM.** The engine rpm shall be displayed in a digital format ranging from 0 rpm to 3500 rpm. The increments shall be in 1 rpm increments or the minimum resolution possible.

(6) **Hydraulic Oil Temperature.** The hydraulic oil temperature shall be displayed in a digital format ranging from -40°F to 200°F (-40°C to 93°C). The increments shall be in 1°F (0.55°C) increments or the minimum resolution possible. The hydraulic oil temperature shall initiate a caution light when the level is above 185°F (85°C).

(7) **Pump Discharge Gauge.** The pump discharge gauge shall be displayed in a digital format ranging from 0 to 300 psi (0 to 2069 kPa). A bar graph with hash marks every 50 psi (344.7 kPa) (starting from 0) shall also be provided for a “quick glance” reference for the user. The increments shall be in 1 psi (6 kPa) increments or the minimum resolution possible.

(8) **Pump Intake Gauge.** The pump intake gauge shall be displayed in a digital format ranging from -30 in. Hg (76.2 cm Hg) to 300 psi (2069 kPa). A bar graph with hash marks every 50 psi (344.7 kPa) (starting from 0) shall also be provided for a “quick glance” reference for the user. The increments shall be in 1 psi (6 kPa) increments or the minimum resolution possible.

(9) **Pump Engaged Indicator Light.** The “pump engaged” display light shall illuminate green once the following conditions have been satisfied:

- The vehicle PTO (Power Take Off) has been engaged.

(10) **Throttle Ready Light.** The “Throttle Ready” shall be displayed and the display light illuminated green once the following conditions have been satisfied:

- The vehicle PTO has been engaged.
- The vehicle’s transmission is in neutral.
- The vehicle parking brake is activated.
- The vehicle’s high idle has been engaged.

If all conditions have been met except for the high idle, the text shall display “High idle not engaged” and the indicator will flash amber until high idle is engaged.

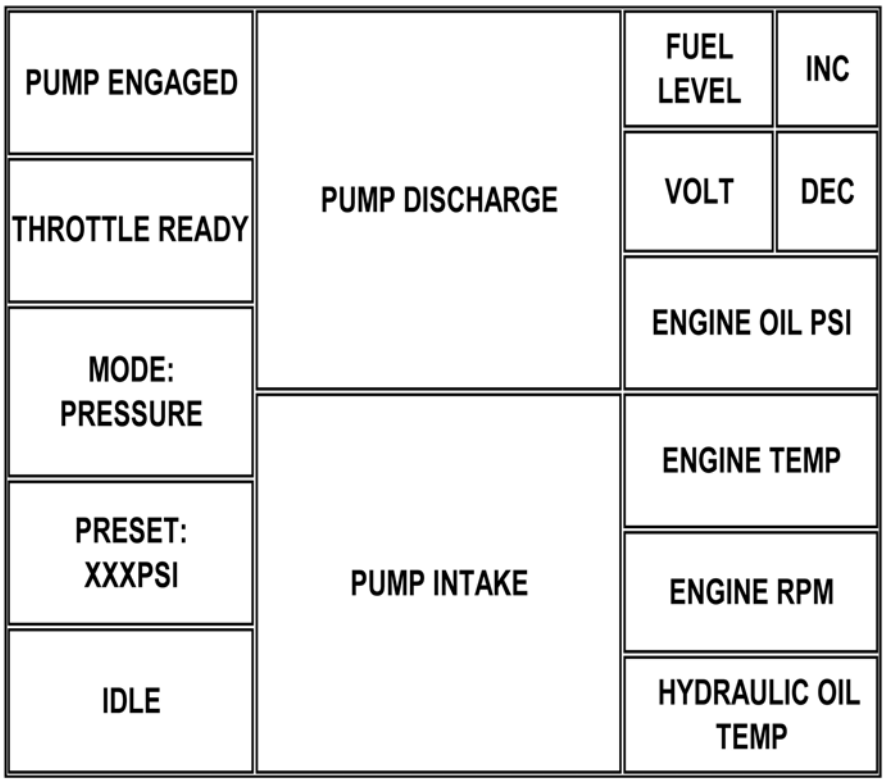


Figure 22. Home Screen When “Throttle Ready” Interlocks Have Been Satisfied.

(11) **Warning Event.** A warning event initiates when a critical system failure or limit has occurred. A critical system is defined as a part or system that may cause the fire apparatus to stop flowing water **immediately** if no action is taken. This event is logged in the diagnostics archive and causes the “Engine RPM” location on the Home screen to read “Warning!” accompanied by a flashing red indicator light on the display and an audible alarm. The OK light shall be illuminated green when scrolling through the warning screens. Once the user has scrolled through the warning screens, the display will return to the Home screen and the warning text should still be visible and illuminated red until the active warnings have disappeared.

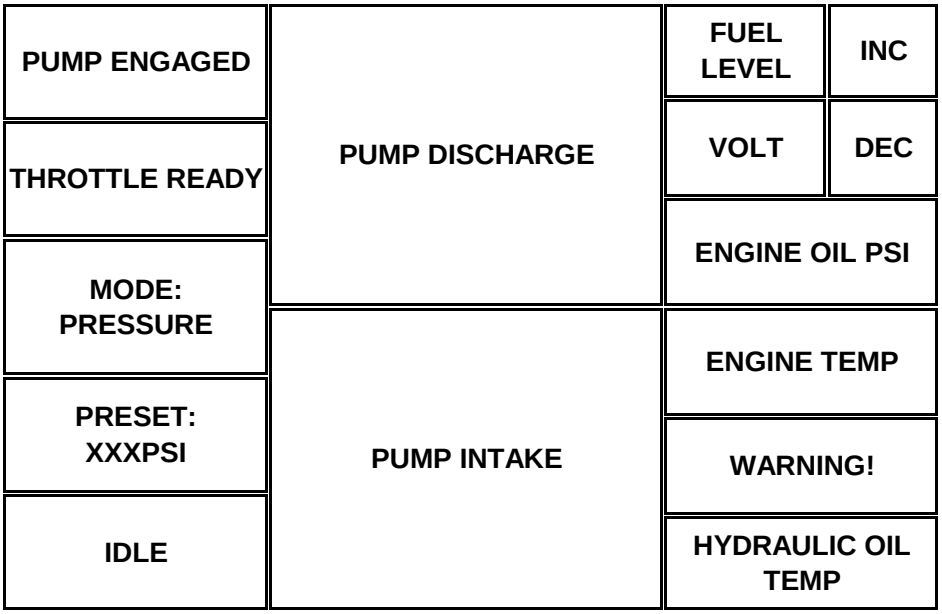


Figure 23. Home Screen When a Warning Event Occurs.

The user may press the flashing red indicator light to view a description of the event that has taken place. Critical system failures or limits that cause a warning event and their descriptive screens are as follows:

- Pump displacement solenoid failure with an open circuit detected.
- Pump displacement solenoid failure with a short circuit.
- Controller ECU communication loss.
- Hydraulic oil level is at a critical level.
- Engine oil level is at a critical level.
- Engine water temperature is at a critical level.
- System voltage is at a critical level.
- Fuel level is at a critical level (under 1/4 tank).

If more than one warning has been issued, the user must view and acknowledge each one before the Home screen may be viewed again. If a warning event and caution event occurs at the same instance, the Home screen display indicator shall flash red instead of amber for sense of priority. The user shall view the warning events before viewing the caution events.

(12) **Caution Event.** A caution event initiates when a non-critical system failure or limit has occurred. A non-critical system is defined as a part or system that may cause the fire apparatus to stop flowing water **eventually** if no action is taken. This event is logged in the diagnostics archive and causes the “Engine RPM” location on the Home screen to read “Caution!” accompanied by a flashing amber indicator light on the display and an audible alarm. The OK light shall be illuminated green when scrolling through the caution screens. Once the user has scrolled through the caution screens, the display will return to the Home screen and the caution text should still be visible and illuminated red until the active cautions have disappeared.

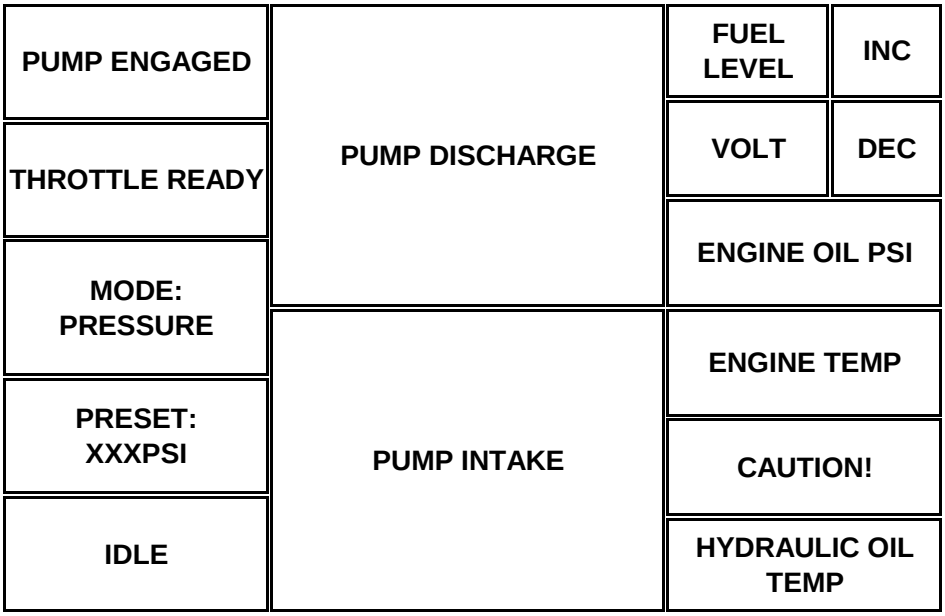


Figure 24. Home Screen When a Caution Event Occurs.

The user may press the flashing amber indicator light to view a description of the event that has taken place. Non-critical system failures or limits that cause a caution event and their descriptive screens are as follows:

- Pump discharge transducer failure with an open circuit detected.
- Pump discharge transducer failure with a short circuit detected.
- Pump intake pressure transducer failure with an open circuit detected.
- Pump intake pressure transducer failure with a short circuit detected.
- Pump intake vacuum transducer failure with an open circuit detected.
- Pump intake vacuum transducer failure with a short circuit detected.
- Hydraulic oil temperature is at a critical level.
- Engine rpm is at a critical level.

If more than one caution has been issued, the user must view and acknowledge each one before the Home screen may be viewed again. If a warning event and caution event occurs at the same instance, the Home screen shall flash red instead of amber for sense of priority. The user shall view the warning events before viewing the caution events.

(13) **Confirmation Selection or "OK Button".** The user may select an option or command that requires a confirmation step before proceeding with the command. In the event of a confirmation request, a pop-up will appear on the screen asking the user if it is OK to proceed with that command. The "OK" button on the display shall illuminate green during this time until 3 seconds has passed or the user has accepted the confirmation by pressing it.

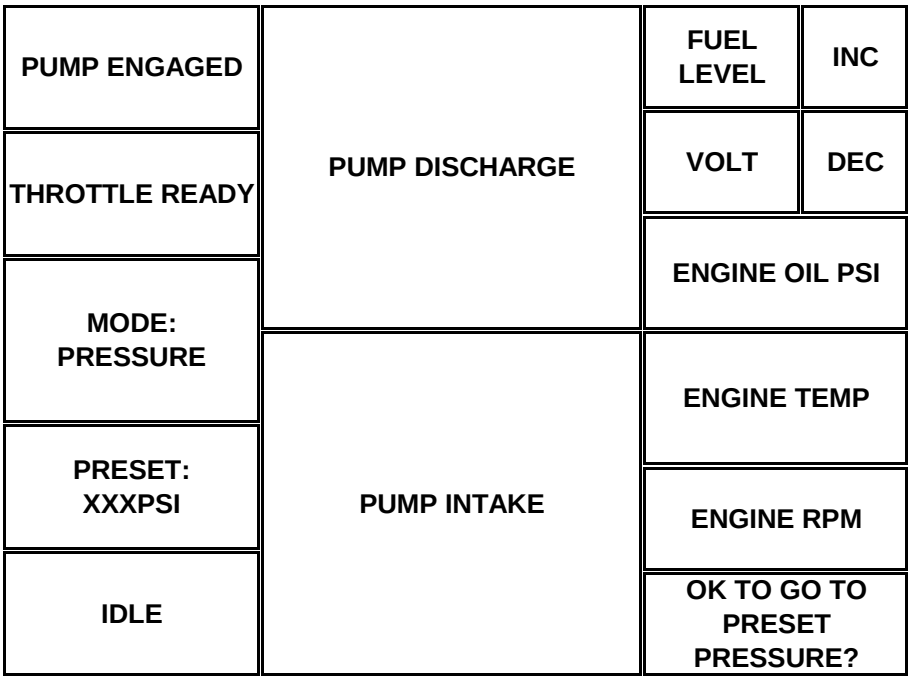


Figure 25. An Example of the Home Screen When a Confirmation "OK" Message Appears.

(14) **Mode Selection.** The mode button allows the user to toggle between pressure mode and manual mode. In pressure mode, the controller ECU receives feedback from the intake and discharge transducers and adjusts the pump displacement solenoid to match the desired pressure inputted by the user. In manual mode, the controller ECU adjusts the pump displacement solenoid with feedback from the system only when available.

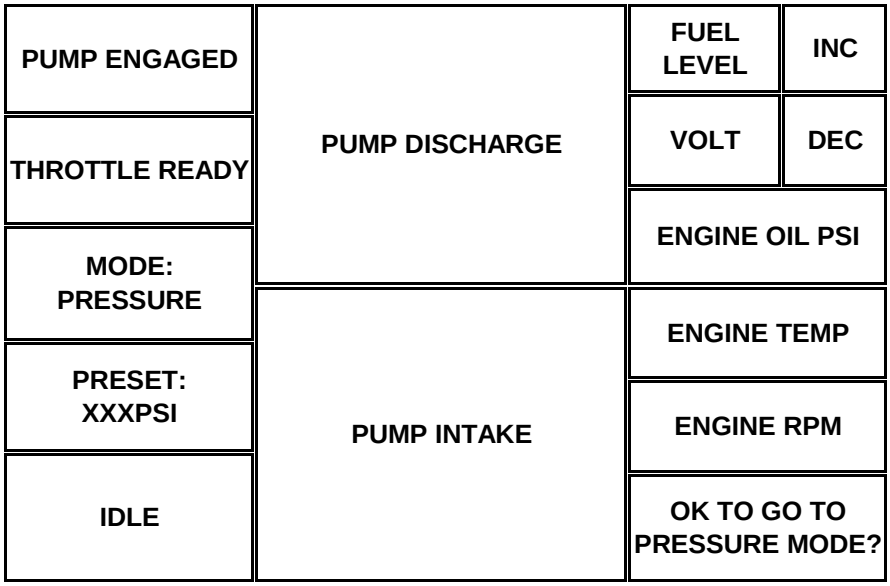


Figure 26. The Home Screen Once the Mode Button Is Pushed To Go Into Pressure Mode.

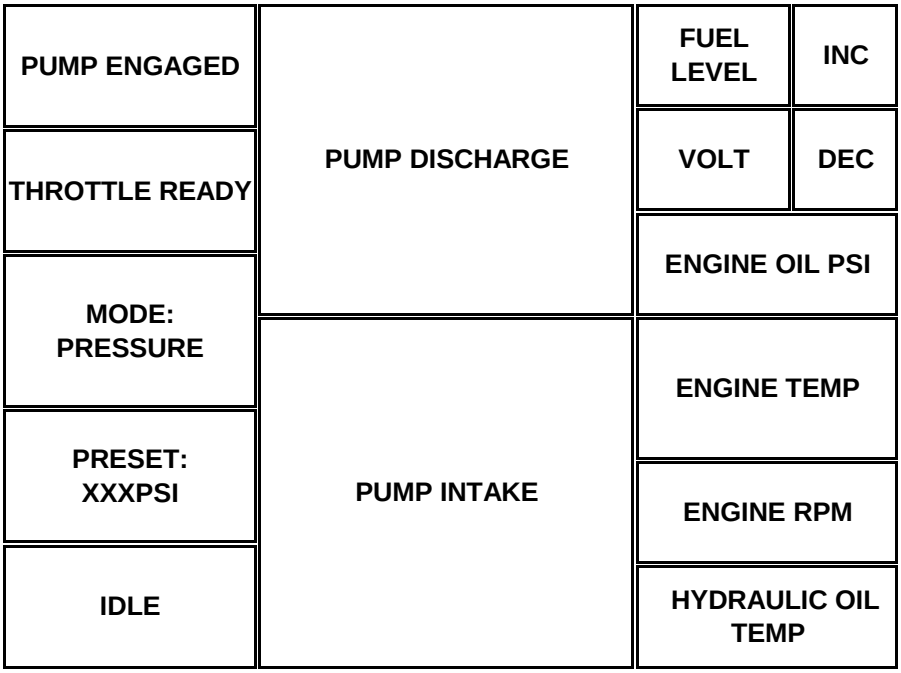


Figure 27. The Home Screen Once the User Presses the OK Button Within 3 Seconds To Go To Pressure Mode.

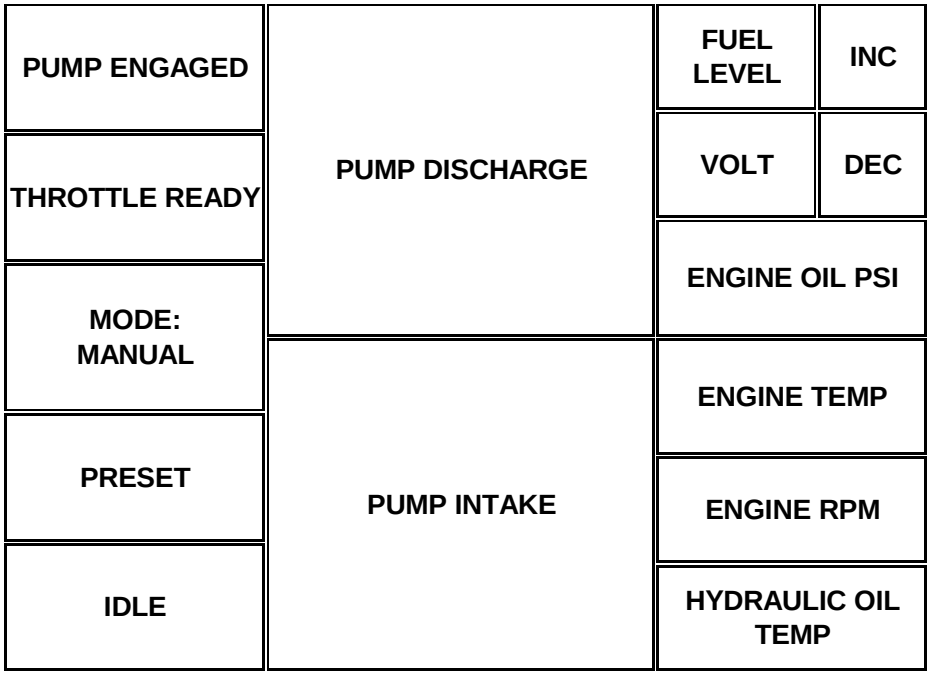


Figure 28. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To Pressure Mode.

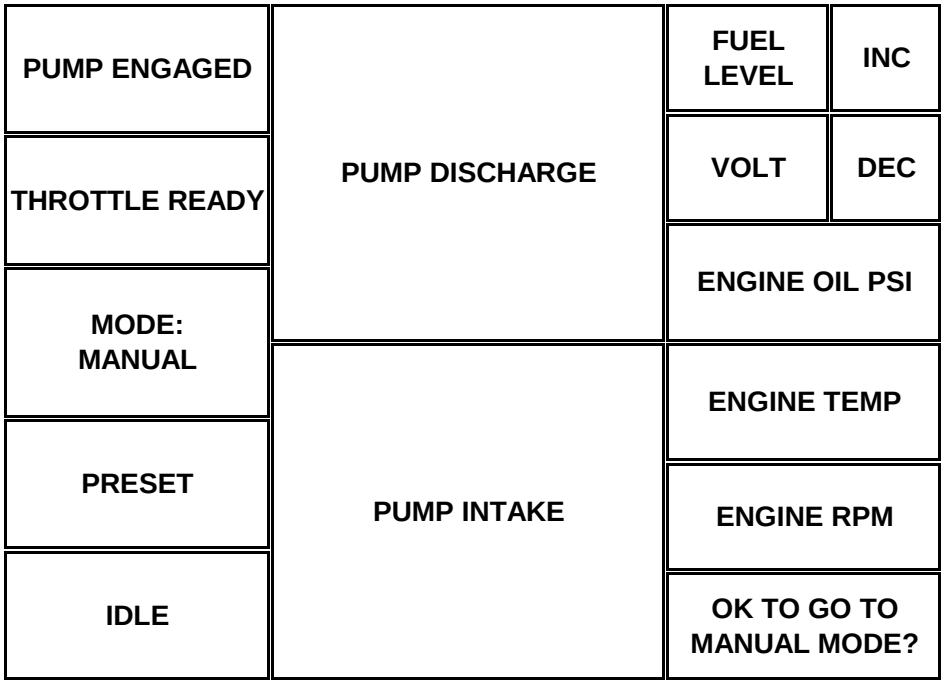


Figure 29. The Home Screen Once the Mode Button Is Pushed To Go Into Manual Mode.

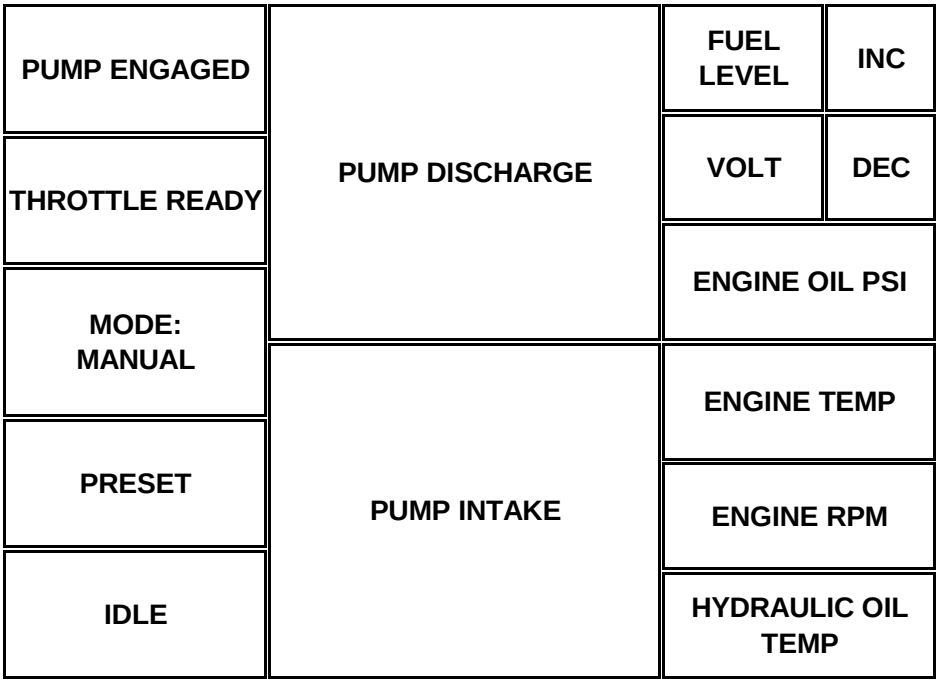


Figure 30. The Home Screen Once the User Presses the OK Button Within 3 Seconds To Go To Manual Mode With the Pressure On the Pump Under 10 psi (68.9 kPa).

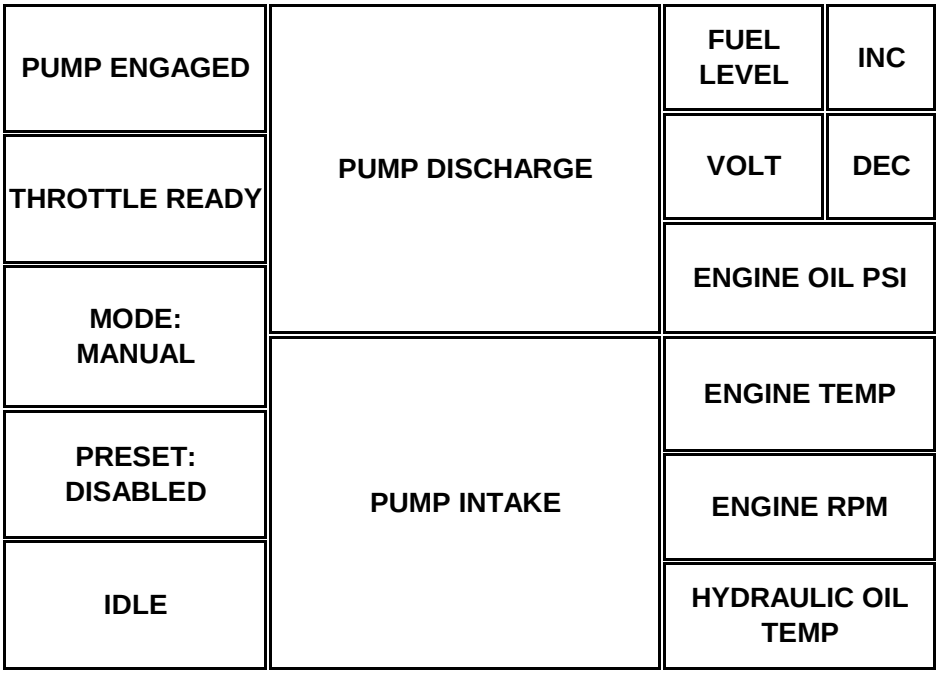


Figure 31. The Home Screen Once the User Presses the OK Button Within 3 Seconds To Go To Manual Mode With the Pressure On the Pump Over 10 psi (68.9 kPa).

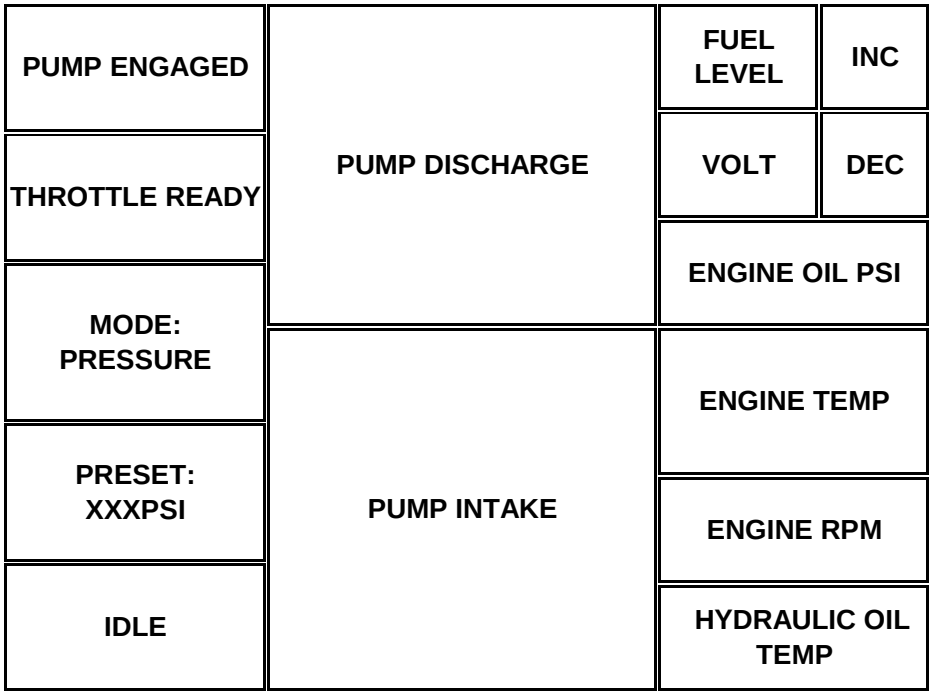


Figure 32. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To Manual Mode.

(15) **Preset Selection.** The preset button allows the user to command the pressure governor to automatically set itself to a predetermined pressure setting or pump displacement solenoid position.

PUMP ENGAGED	PUMP DISCHARGE	FUEL LEVEL	INC
THROTTLE READY		VOLT	DEC
MODE: PRESSURE		ENGINE OIL PSI	
	PUMP INTAKE	ENGINE TEMP	
PRESET: XXXPSI		ENGINE RPM	
IDLE		OK TO GO TO PRESET PRESSURE?	

Figure 33. The Home Screen Once the Preset Button Is Pushed To Go To a Preset Pressure.

PUMP ENGAGED	PUMP DISCHARGE	FUEL LEVEL	INC
THROTTLE READY		VOLT	DEC
MODE: PRESSURE		ENGINE OIL PSI	
	PUMP INTAKE	ENGINE TEMP	
PRESET: XXXPSI		ENGINE RPM	
IDLE		HYDRAULIC OIL TEMP	

Figure 34. The Home Screen Once the Preset Pressure Value Is Reached.

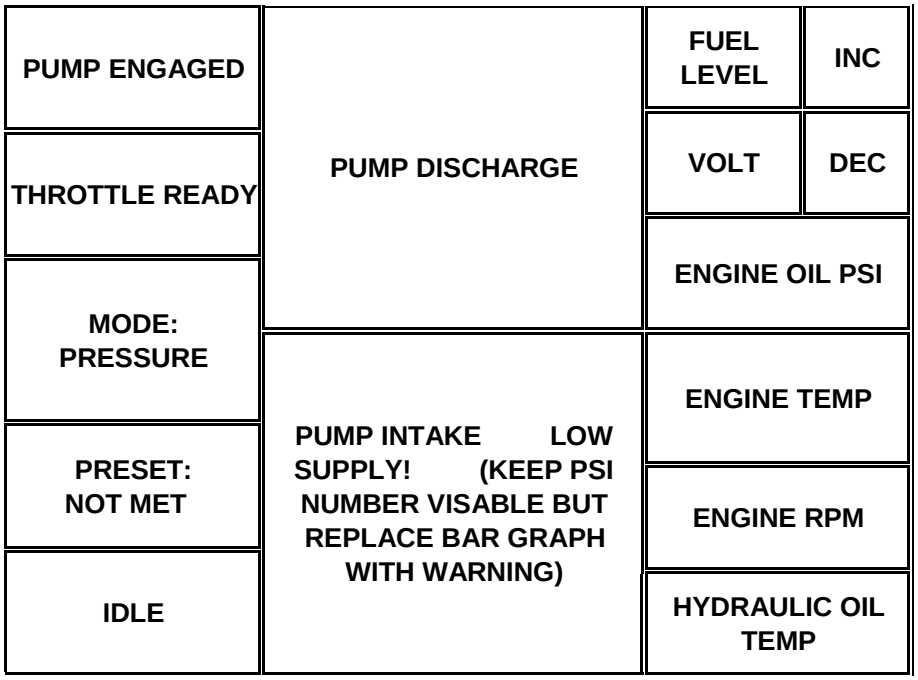


Figure 35. The Home Screen If the Preset Pressure Cannot Be Reached and the Engine RPM Is Above 1000.

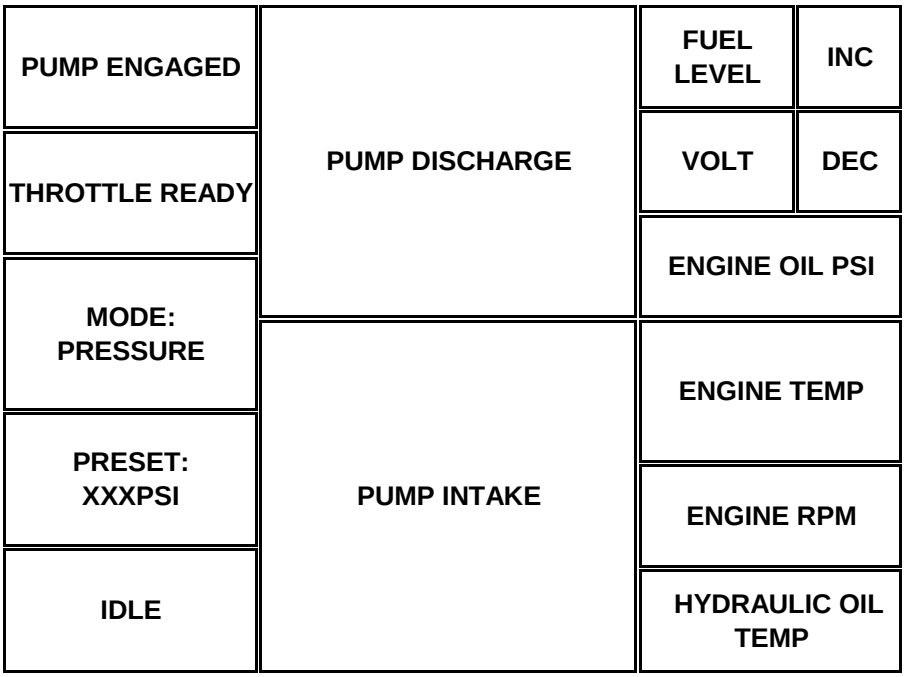


Figure 36. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To a Preset Pressure.

(16) **Idle Selection.** The idle button allows the user to stop the flow of water and return the pump to a neutral state.

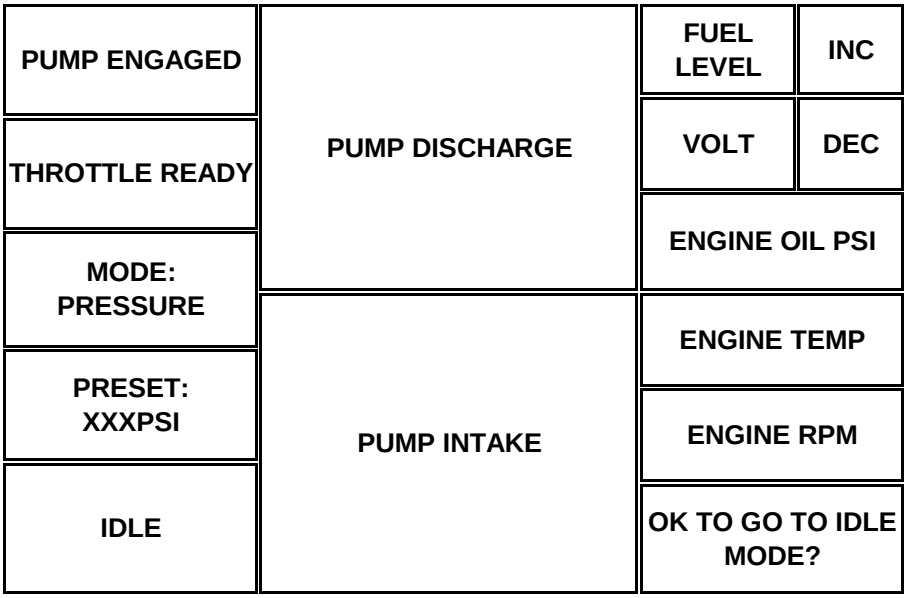


Figure 37. The Home Screen Once the Idle Button Is Pushed To Go To Idle Mode.

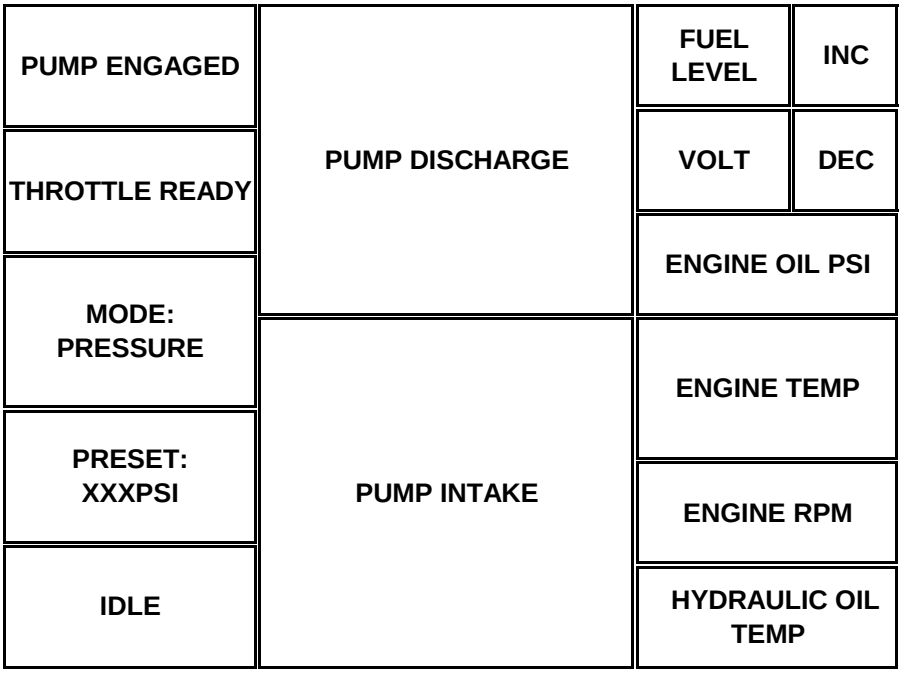


Figure 38. The Home Screen If the User Presses the OK Button Within 3 Seconds To Go To Idle Mode.

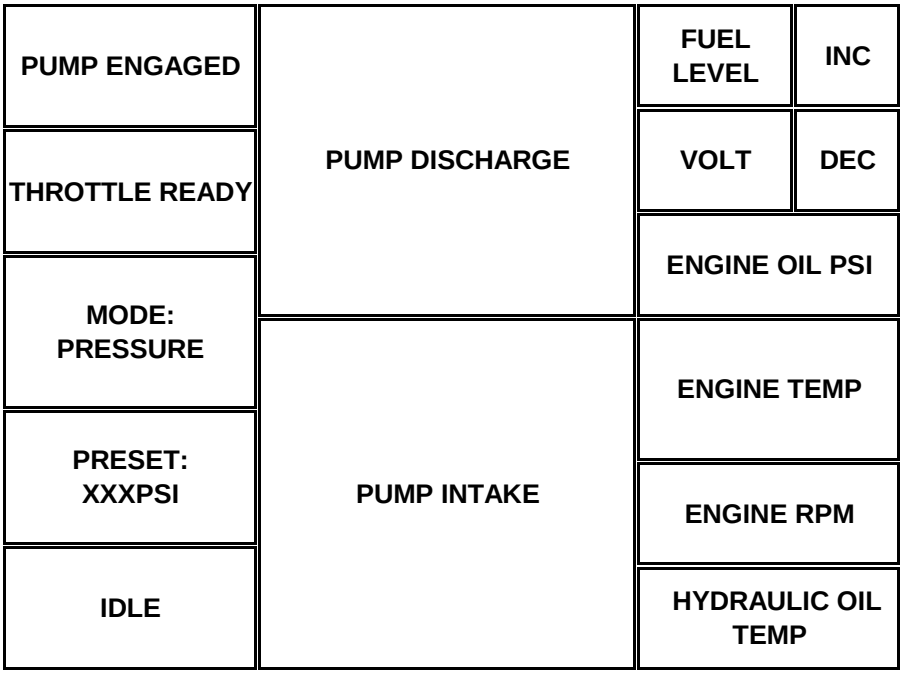


Figure 39. The Home Screen If the User Does Not Press the OK Button Within 3 Seconds To Go To Idle Mode.

(17) **Increase Selection.** The increase button allows the user to adjust the output of water flow manually. If the system is in pressure mode, the user may increase the pressure in 3 psi (20.7 kPa) increments for every button push or 75 psi (517 kPa) for every button hold. If the system is in manual mode, the user may increase the pump displacement solenoid output by 1% for every button push or 25% for every button hold.

(18) **Decrease Selection.** The decrease button allows the user to adjust the output of water flow manually. If the system is in pressure mode, the user may decrease the pressure in 3 psi (20.7 kPa) increments for every button push or the minimum pressure for a button hold. If the system is in manual mode, the user may decrease the pump displacement solenoid output by 1% for every button push or down to 0% displacement for a button.

(19) **Menu Selection.** The menu button allows the user to access auxiliary functions of the pressure governor system. These auxiliary functions include:

- Display Enable
- Settings
- Diagnostics
- Calibrations
- SVC Mode Password
- Change SVC Mode Password

(b) **Display Enable.** The display enable function allows the user to take control of the pressure governor from a specific display location. Only one display location will be active at a time. The user will need to confirm a display enable action.

The display enable function screen shall look like Figure 40:

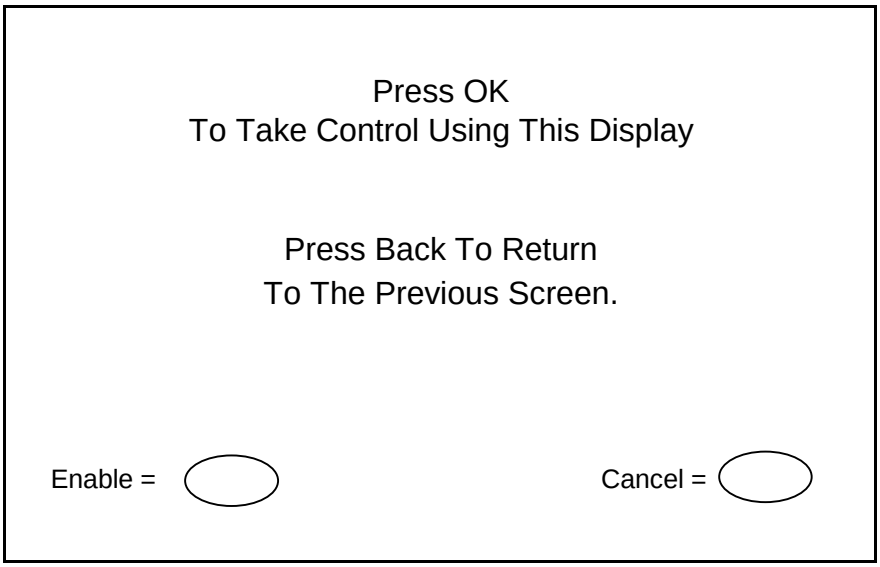


Figure 40. The Display Enable Screen.

(c) **Settings.** The settings function allows the user to access hardware and software settings for the system. The settings function is broken down into the following sections:

- Display Settings
- Configuration

Display settings control the appearance of the display. It may be accessed by any user and will not require password protection. The display settings shall accommodate the following setting changes:

- Units - The user may choose to view all units in English (default) or Metric.
- Contrast - The user may adjust the contrast of the screen ranging from 0% to 100% contrast. A contrast of 50% is default.
- Brightness - The user may adjust the brightness of the screen ranging from 0% to 100% brightness. A brightness of 50% is default.
- Backlighting - The user may choose to have the backlighting turned on (default) or off.

Configuration controls the presets of the pressure governor as well as button press durations. It may be accessed by any user and will not require password protection. The configuration menu shall accommodate the following setting changes:

- Buzzer Duration - The user may choose a continuous, one second, two second, or five second (default) buzzer duration upon an event that initiates an audible alarm.
- Button Hold - The user may choose a one second (default), two second, or five second button hold duration upon an event that requires a button hold.
- Preset Pressure - The user may set a preset pressure ranging from 0 to 300 psi (0 to 2069 kPa). A preset pressure of 150 psi (1034 kPa) is default. The user must confirm a change in the preset pressure if changed.
- Preset Output - The user may set a preset output to the pump displacement solenoid ranging from 0% to 60%. A preset output of 50% is default. The user must confirm a change in the preset output if changed.

(d) **Diagnostics.** The diagnostics function allows the user to view a detailed listing of the errors that have occurred with the system. The errors shall be logged for 255 engine starts from the first occurrence before being removed from the list. It may be accessed by any user and will not require password protection. The diagnostics screen shall list the following information:

- Mid - This ID code shall display the source of the error (ECU, cab display, pump panel display).
- Code - This code shall list a 4-digit component identifier code that will identify what part or system has failed. It should also include a 1-digit failure code that explains how it failed (short, open, etc.). These codes shall be listed together and separated by a dash (ex: XXXX-X).
- Occurrences - This shall list the number of times this error has occurred.
- First - This shall list the initial time, based on a time scale, of when the error first occurred.
- Last - This shall list the final time, based on a time scale, of when the error last occurred.
- Active - This shall list if the error is still active. An “X” will be used to define an active error and a “-“ will be used for a non-active error.

The user shall have the ability to scroll through the error code list, activate the OK button on a highlighted error code and view a detailed description of that error code.

(e) **Calibrations.** The calibrations function may only be accessed if the service password has been entered.

The calibrations function allows the user to adjust the software-coded variables that control the sensitivity of the system. The calibrations screen shall have the following variable changing abilities:

- Imin - The user may adjust the minimum current sent to the pump displacement solenoid.
- Imax - The user may adjust the maximum current sent to the pump displacement solenoid.
- Proportional - The user may adjust the proportional variable of the PID loop gain.
- Integral - The user may adjust the integral variable of the PID loop gain.
- Differential - The user may adjust the differential variable of the PID loop gain.

(f) **SVC Mode Password.** The service mode password function will allow the user to access password protected screens by inputting the correct 5-digit code.

(g) **Change Password.** The change password function may only be accessed if the service password has been entered.

The change password function shall allow the user to change the 5-digit code that grants access to password protected screens.

d. Input Specification and Requirements.

1. **Inputs.**

(a) **System Voltage.**

(b) **Engine Oil Pressure.**

(c) **Engine Water Temperature.**

(d) **Engine RPM.**

(e) **Display Data.**

(f) **Fuel Level (Analog).**

(g) **Hydraulic Oil Temperature (Analog).**

(h) **Pump Intake Pressure (Analog).**

(i) **Pump Discharge Pressure (Analog).**

(j) **Hydraulic Oil Level Low (Digital).**

2. **Outputs.**

(a) **Pump Displacement Solenoid: (Hardwire).**

(b) **Audio Alarm: (Hardwire).**

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PUMPING FROM DRAFT (MAIN INLET)

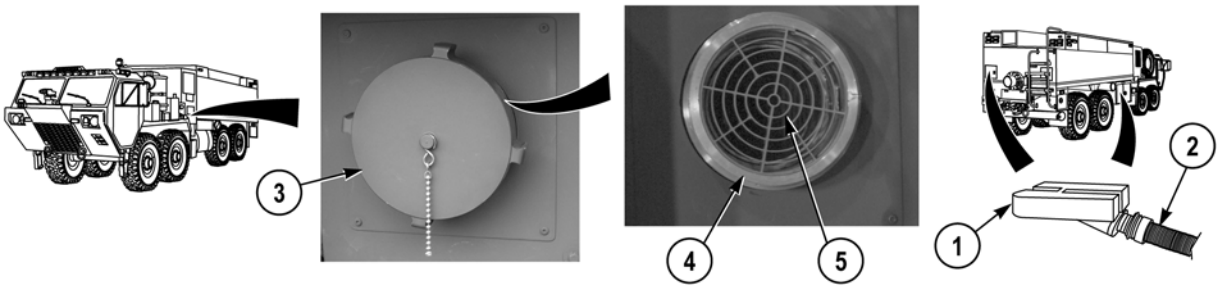
WARNING

When backing up vehicle, one crew member must be in back of vehicle operating rear step buzzer to communicate with operator. Failure to comply may result in injury or death to personnel and/or damage to equipment.

NOTE

Performance is maximized with less than a 10 ft. (3 m) vertical lift. As vertical lift increases above 10 ft. (3 m), maximum pump capacity will be reduced. Altitude also affects pump performance.

1. Position vehicle as close to water source as possible.
2. Park vehicle (TM 9-2320-279-10).



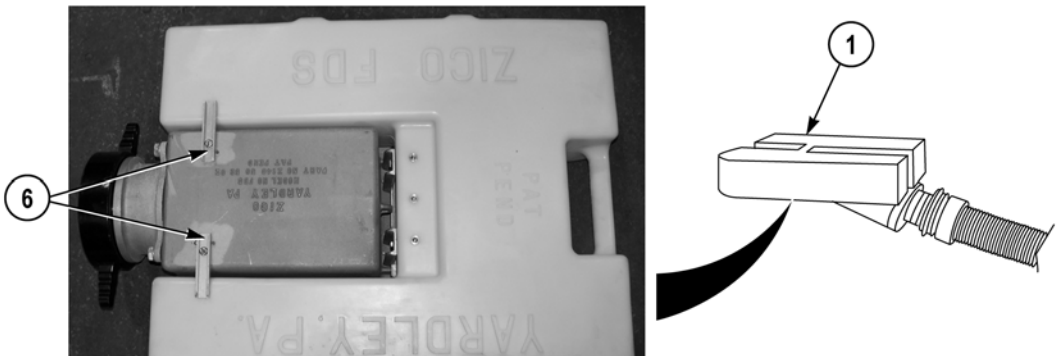
CAUTION

Ensure suction hose strainer is clean and free from debris and other obstructions. Failure to comply may result in damage to equipment.

NOTE

- Ensure all valves are in closed position, and inlet and discharge caps are securely tightened before proceeding to Step 3. A rubber mallet may be required to securely tighten hard suction hose couplings to suction hose strainer and main inlet.
- Ensure suction hose connections and gaskets are free from dirt and debris prior to installation.

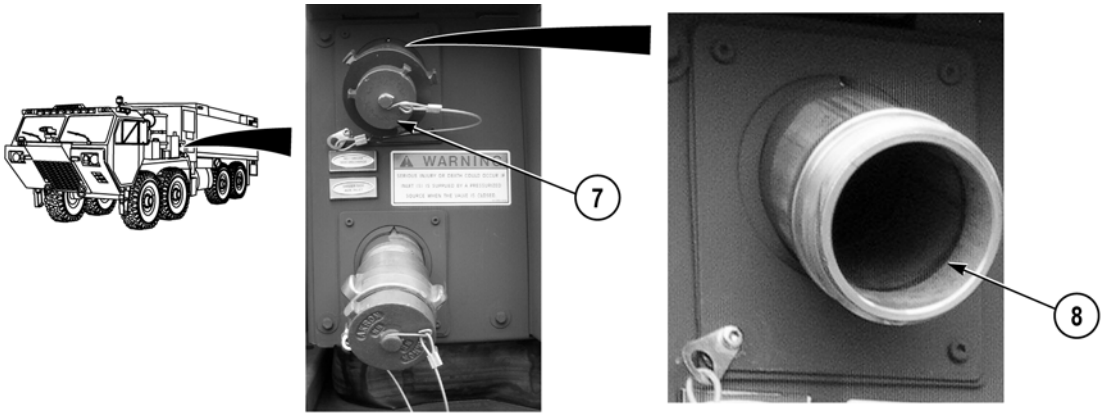
3. Connect suction hose strainer (1) to hard suction hose (2).
4. Remove cap (3) from driver main inlet (4).
5. Ensure strainer (5) is present and free of debris.
6. Connect hard suction hose (2) securely to driver main inlet (4).



WARNING

Strainer must be positioned in water to prevent sucking of debris (sand, stones, mud, etc.). Strainer must be deep enough not to cause a whirlpool on surface of water. Failure to comply may result in injury or death to personnel and/or damage to equipment.

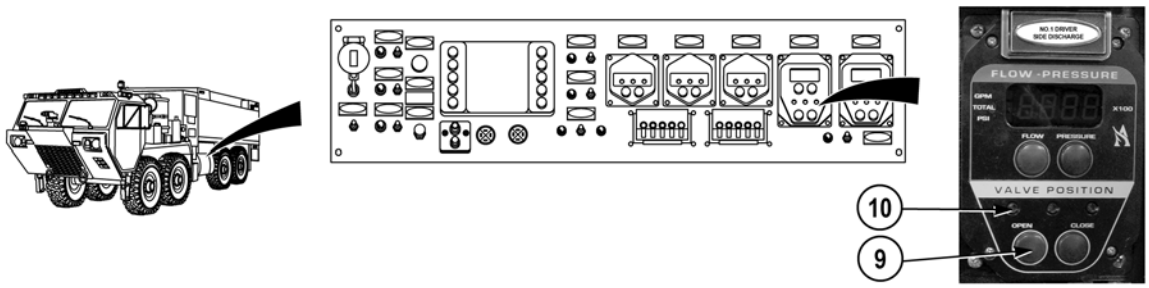
7. Unlatch suction hose strainer release clips (6).
8. Position suction hose strainer (1) in water source.



NOTE

NO. 1 DRIVER SIDE DISCHARGE and NO. 2 PASSENGER SIDE DISCHARGE operate the same way. NO. 1 DRIVER SIDE DISCHARGE shown.

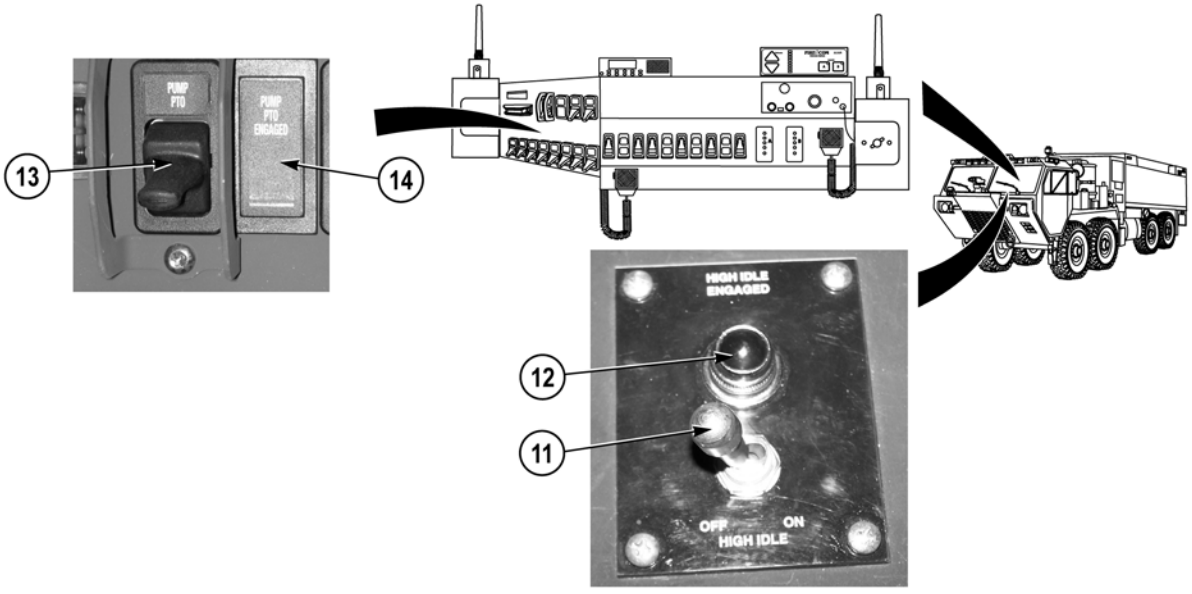
9. Remove cap (7) from NO. 1 DRIVER SIDE DISCHARGE (8).
10. Connect discharge hose to NO. 1 DRIVER SIDE DISCHARGE (8).
11. Prime water pump (WP 0015).



NOTE

Valve is completely open when green indicator light illuminates.

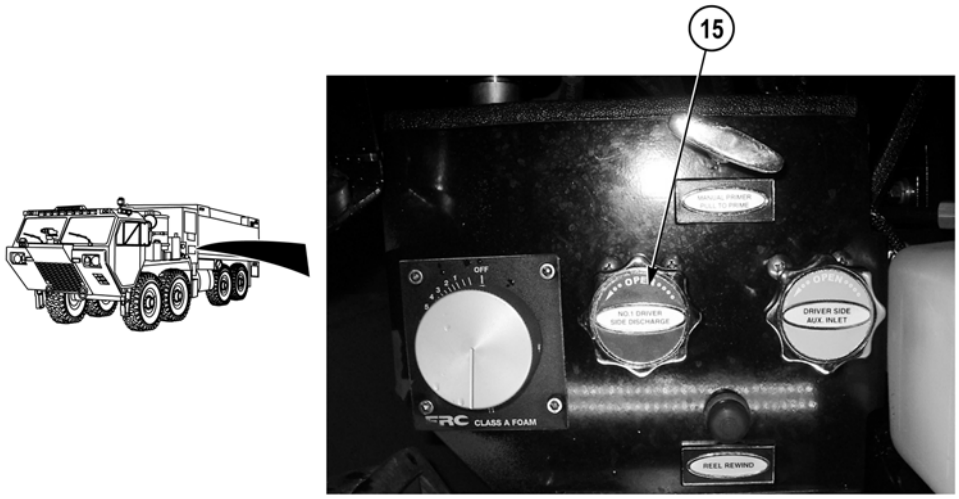
12. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (9) until green indicator light (10) illuminates.
13. Complete mission.



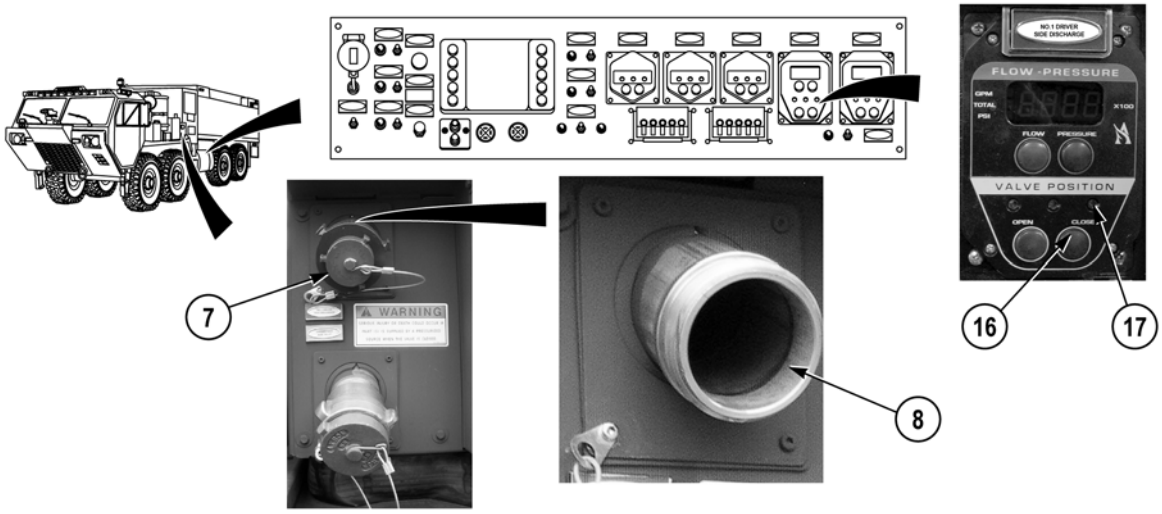
NOTE

Valve is completely closed when red indicator light illuminates.

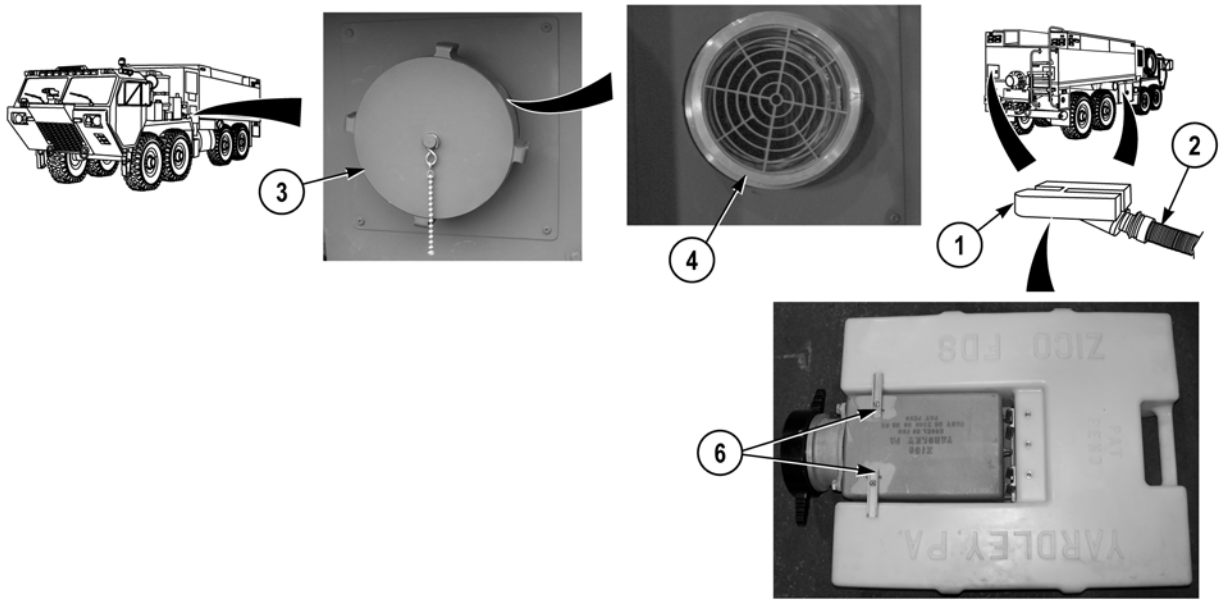
14. Put HIGH IDLE switch (11) to OFF position. Indicator light (12) will go out.
15. Put PTO PUMP switch (13) to off position. Indicator light (14) will go out.



16. Open NO. 1 DRIVER SIDE DISCHARGE drain valve (15).



17. After pressure governor reading drops to 0 psi (0 kPa), push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (16) until red indicator light (17) illuminates.
18. Close NO. 1 DRIVER SIDE DISCHARGE drain valve (15).
19. Disconnect discharge hose from NO. 1 DRIVER SIDE DISCHARGE (8).
20. Install cap (7) on NO. 1 DRIVER SIDE DISCHARGE (8).



21. Disconnect hard suction hose (2) from driver side main inlet (4).
22. Install cap (3) on driver side main inlet (4).
23. Disconnect suction hose strainer (1) from hard suction hose (2).
24. Latch suction hose strainer release clips (6) and stow.
25. Perform post operation procedures (WP 0029).

END OF TASK

END OF WORK PACKAGE

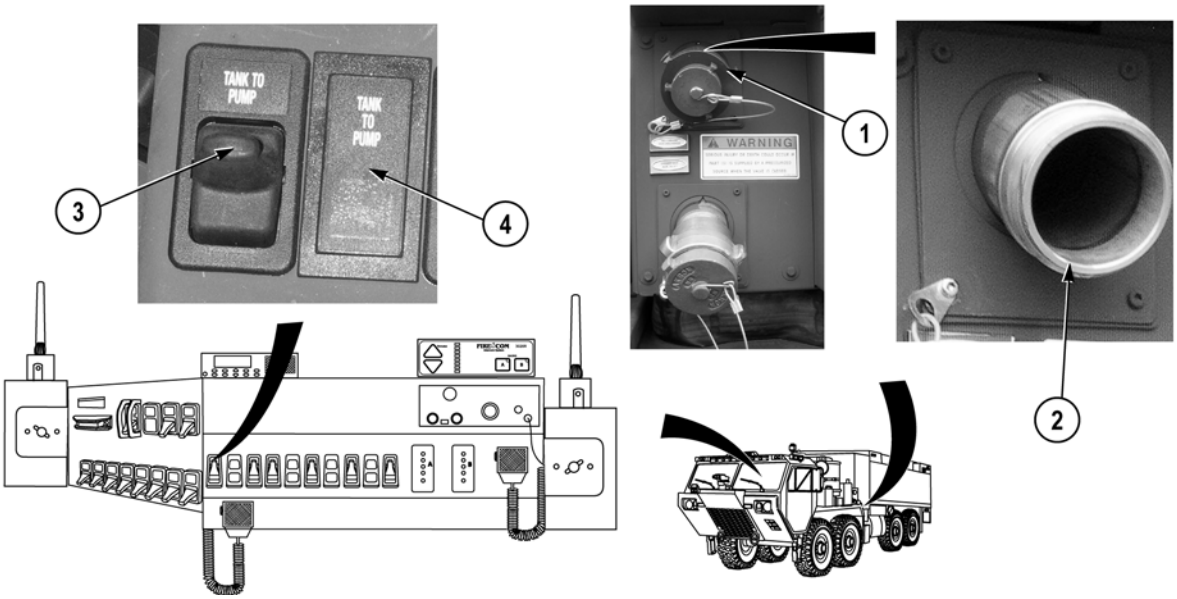
OPERATOR MAINTENANCE

PUMPING FROM ONBOARD WATER TANK

WARNING

When backing up vehicle, one crew member must be in back of vehicle operating rear step buzzer to communicate with operator. Failure to comply may result in injury or death to personnel and/or damage to equipment.

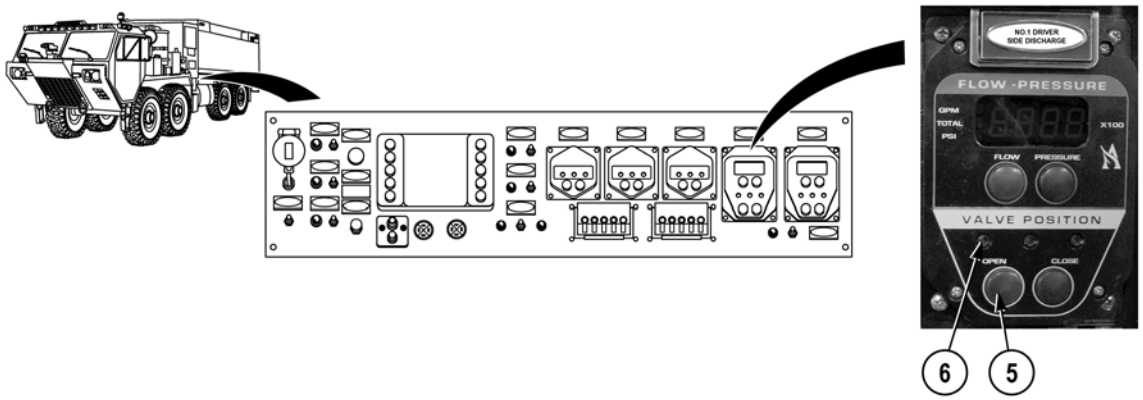
1. Position vehicle for convenient discharge hose layout, and bring vehicle to complete stop.
2. Park vehicle (TM 9-2320-279-10).



NOTE

NO. 1 DRIVER SIDE DISCHARGE and NO. 2 PASSENGER SIDE DISCHARGE operate the same way. NO. 1 DRIVER SIDE DISCHARGE shown.

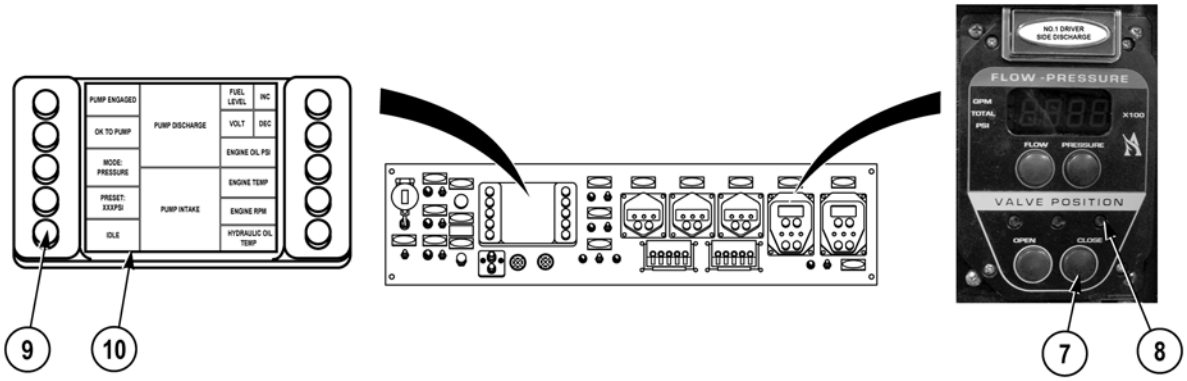
3. Remove cap (1) from NO. 1 DRIVER SIDE DISCHARGE (2).
4. Connect discharge hose to NO. 1 DRIVER SIDE DISCHARGE (2).
5. Put TANK TO PUMP switch (3) to on position. Indicator light (4) will illuminate.
6. Prime water pump (WP 0015).



NOTE

Valve is completely open when green indicator light illuminates.

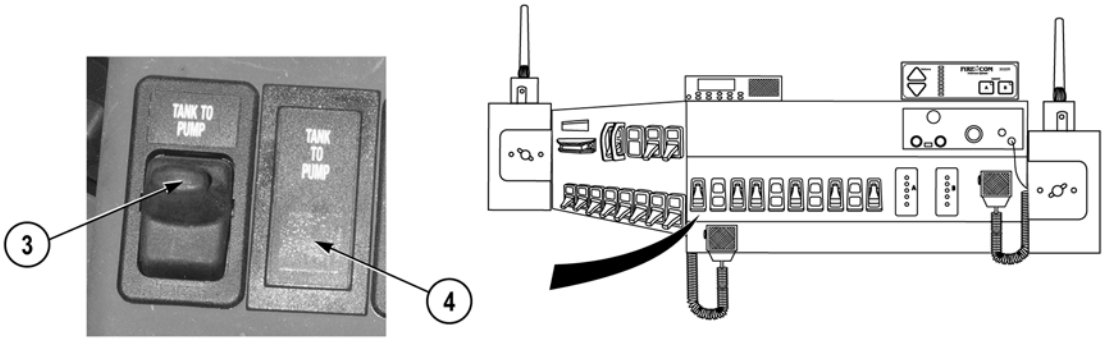
7. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (5) until green indicator light (6) illuminates.
8. Set pressure governor control to desired pressure setting (WP 0016).
9. Complete mission.



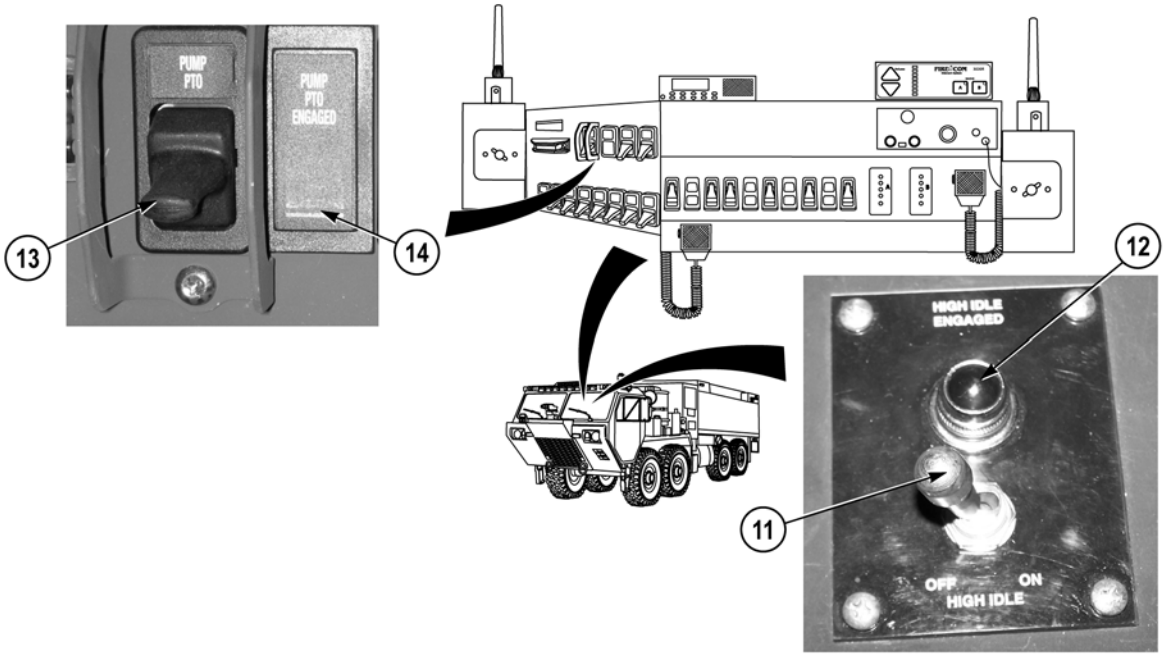
NOTE

Valve is completely closed when red indicator light illuminates.

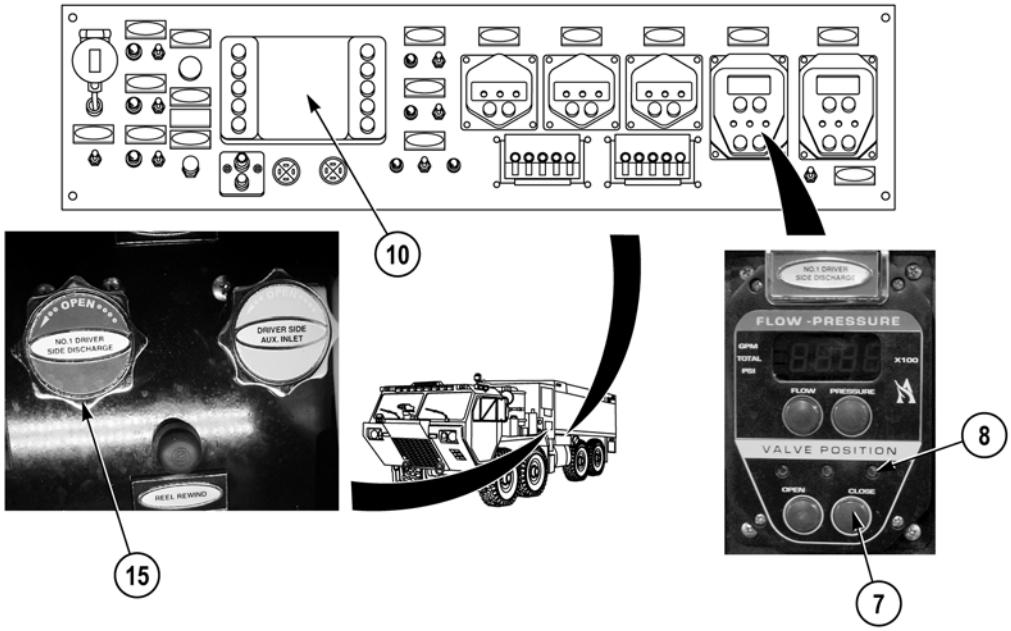
10. Push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (7) until red indicator light (8) illuminates.
11. Push IDLE button (9) on pressure governor (10).



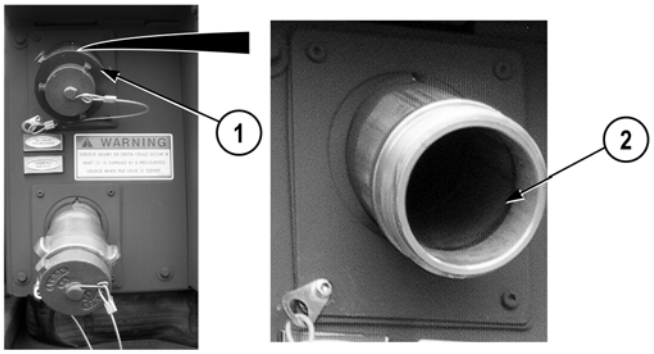
12. Put TANK TO PUMP switch (3) to off position. Indicator light (4) will go out.



13. Put HIGH IDLE switch (11) to OFF position. Indicator (12) will go out.
14. Put PUMP PTO switch (13) to off position. Indicator light (14) will go out.
15. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (5) until green indicator light (6) illuminates.



16. Open NO. 1 DRIVER SIDE DISCHARGE drain valve (15).
17. After pressure governor (10) reading drops to 0 psi (0 kPa), push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (7) until red indicator light (8) illuminates.
18. Close NO. 1 DRIVER SIDE DISCHARGE drain valve (15).



19. Disconnect discharge hose from NO. 1 DRIVER SIDE DISCHARGE (2).
20. Install cap (1) on NO. 1 DRIVER SIDE DISCHARGE (2).

END OF TASK

END OF WORK PACKAGE

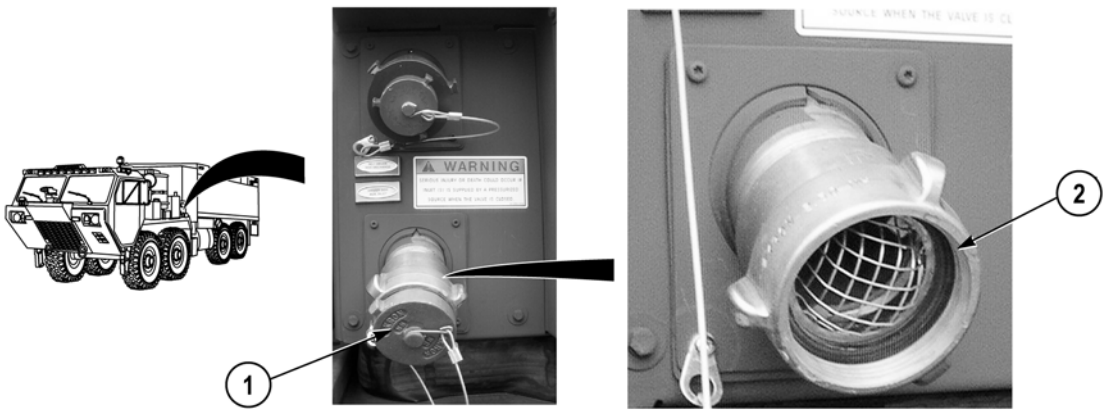
OPERATOR MAINTENANCE

PUMPING FROM HYDRANT OR IN RELAY (POSITIVE WATER SOURCES)

WARNING

When backing up vehicle, one crew member must be in back of vehicle operating rear step buzzer to communicate with operator. Failure to comply may result in injury or death to personnel and/or damage to equipment.

1. Position vehicle as close to water source as possible.
2. Park vehicle (TM 9-2320-279-10).



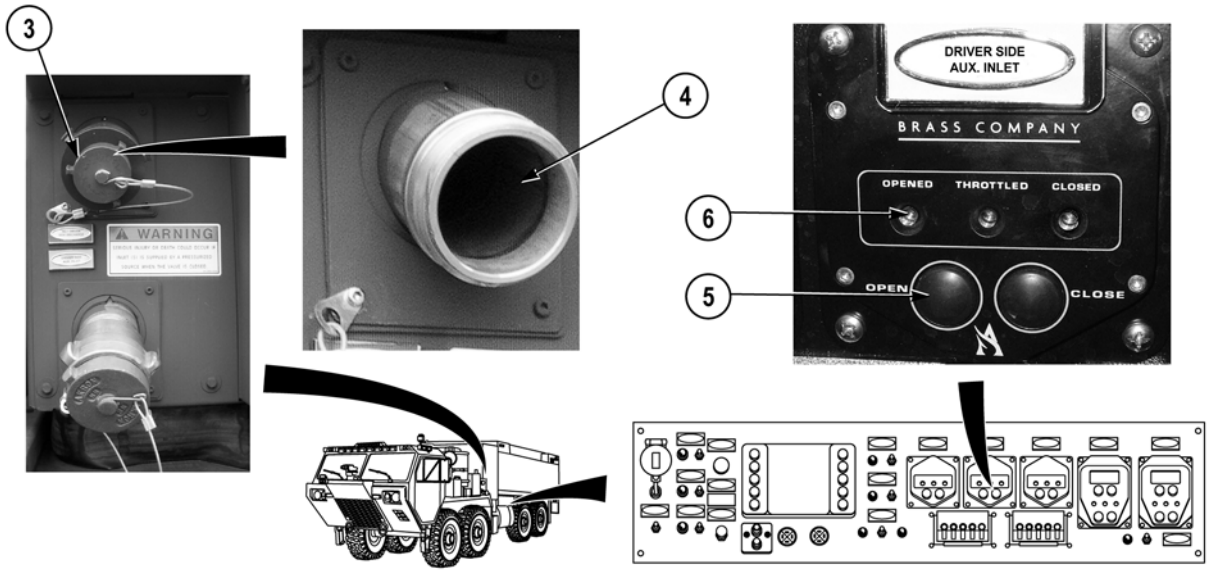
WARNING

Do not use hard suction hose. Hard suction hose will not hold pressure. Hose may fail and separate causing injury to personnel and/or damage to equipment.

NOTE

DRIVER SIDE AUX. INLET and PASSENGER SIDE AUX. INLET operate the same way. DRIVER SIDE AUX. INLET shown.

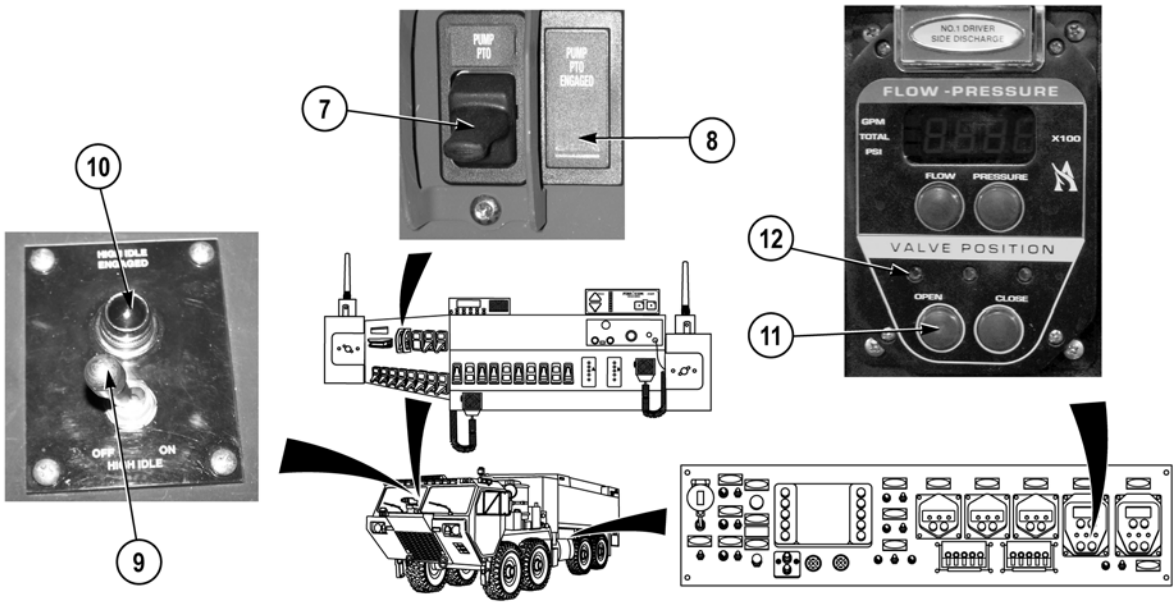
3. Remove cap (1) from DRIVER SIDE AUX. INLET (2).
4. Connect 3 in. (7.6 cm) supply hose between DRIVER SIDE AUX. INLET (2) and positive water source.



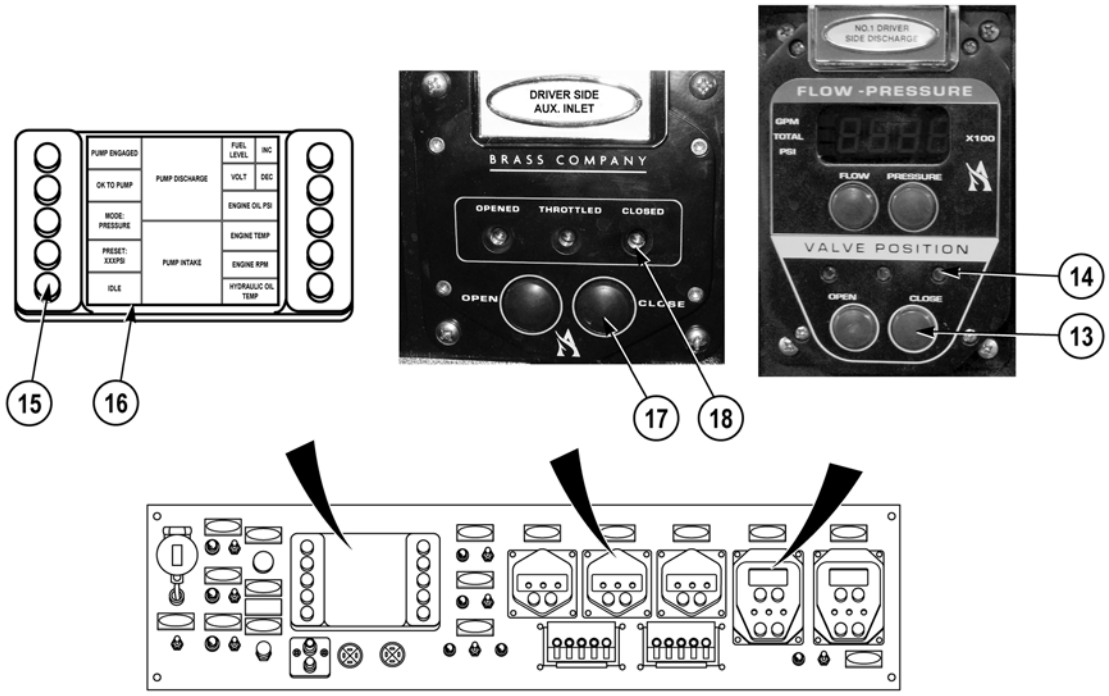
NOTE

- Valve is completely open when green indicator light illuminates.
- NO.1 DRIVER SIDE DISCHARGE and NO. 2 PASSENGER SIDE DISCHARGE operate the same way. NO. 1 DRIVER SIDE DISCHARGE shown.

5. Remove cap (3) from NO. 1 DRIVER SIDE DISCHARGE (4).
6. Connect soft discharge hose to NO. 1 DRIVER SIDE DISCHARGE (4).
7. Push DRIVER SIDE AUX. INLET valve control OPEN button (5) until green indicator light (6) illuminates.
8. Open valve on positive water source.



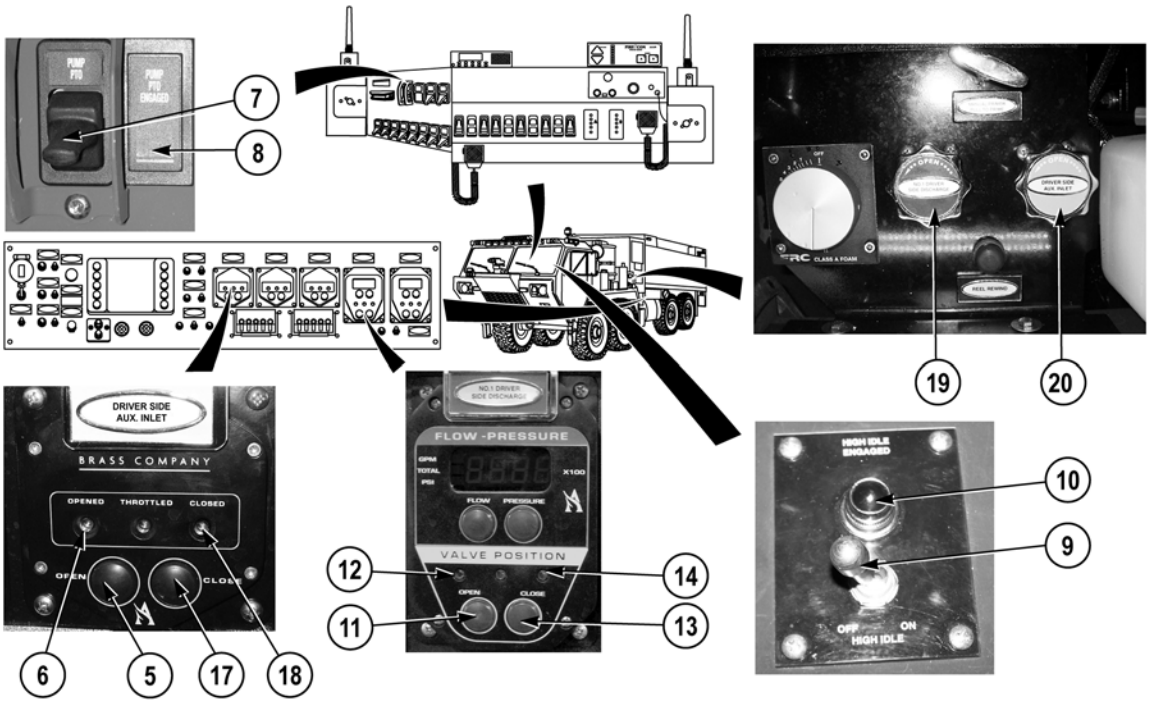
9. Put PUMP PTO switch (7) to on position. Indicator light (8) will illuminate.
10. Put HIGH IDLE switch (9) to ON position. Indicator light (10) will illuminate.
11. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (11) until green indicator light (12) illuminates.
12. Set pressure governor to desired pressure setting (WP 0016).
13. Complete mission.



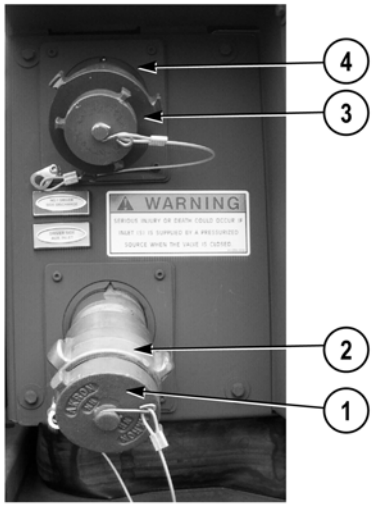
NOTE

Valve is completely closed when red indicator light illuminates.

14. Push DRIVER SIDE DISCHARGE valve control CLOSE button (13) until red indicator light (14) illuminates.
15. Push IDLE button (15) on pressure governor (16).
16. Close valve on positive water source.
17. Push DRIVER SIDE AUX. INLET valve control CLOSE button (17) until red indicator light (18) illuminates.



18. Put HIGH IDLE switch (9) to OFF position. Indicator light (10) will go out.
19. Put PTO PUMP switch (7) to off position. Indicator light (8) will go out.
20. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (11) until green indicator light (12) illuminates.
21. Open NO.1 DRIVER SIDE DISCHARGE drain valve (19).
22. After pressure governor reading drops to 0 psi (0 kPa), push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (13) until red indicator light (14) illuminates.
23. Close NO. 1 DRIVER SIDE DISCHARGE drain valve (19).
24. Push DRIVER SIDE AUX. INLET valve control OPEN button (5) until green indicator light (6) illuminates.
25. Open DRIVER SIDE AUX. INLET drain valve (20).
26. After pressure governor reading drops to 0 psi (0 kPa), push DRIVER SIDE AUX. INLET valve control CLOSE button (17) until red indicator light (18) illuminates.
27. Close DRIVER SIDE AUX. INLET drain valve (20).



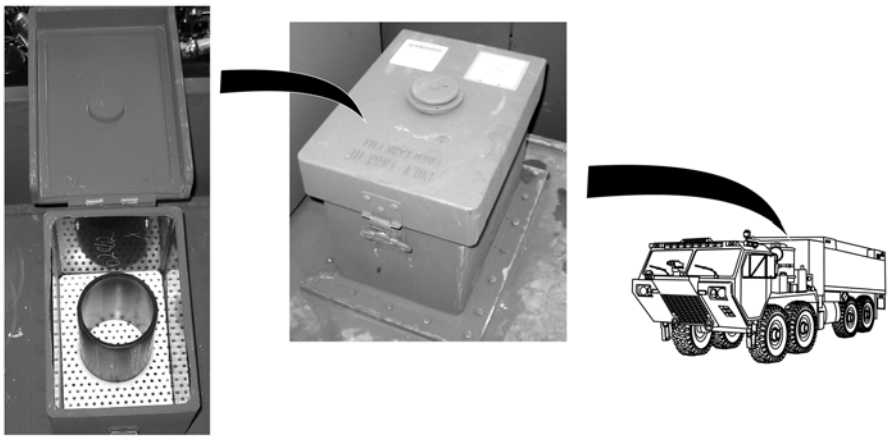
28. Disconnect discharge hose from NO. 1 DRIVER SIDE DISCHARGE (4).
29. Install cap (3) on NO. 1 DRIVER SIDE DISCHARGE (4).
30. Disconnect supply hose from DRIVER SIDE AUX. INLET (2) and positive water source.
31. Install cap (1) on DRIVER SIDE AUX. INLET (2).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FOAM SYSTEM GENERAL INFORMATION



⚠ CAUTION

- **Do not mix different types or manufacturers' brands of foam agent in foam tank or piping. Mixing of different foam agents (either type or manufacturer) may cause deterioration of foam agent, improper proportioning, and poor performance in a fire situation. Mixing of Class A and different types of foam agents may result in a chemical reaction which can create globules, which can clog orifices and cause system failure.**
- **When in foam mode, never open TANK FILL & RE-CIRCULATING LINE valve control. This will cause foam agent to enter water tank. If recirculation is needed to keep pump cool, open PUMP COOLER valve.**

NOTE

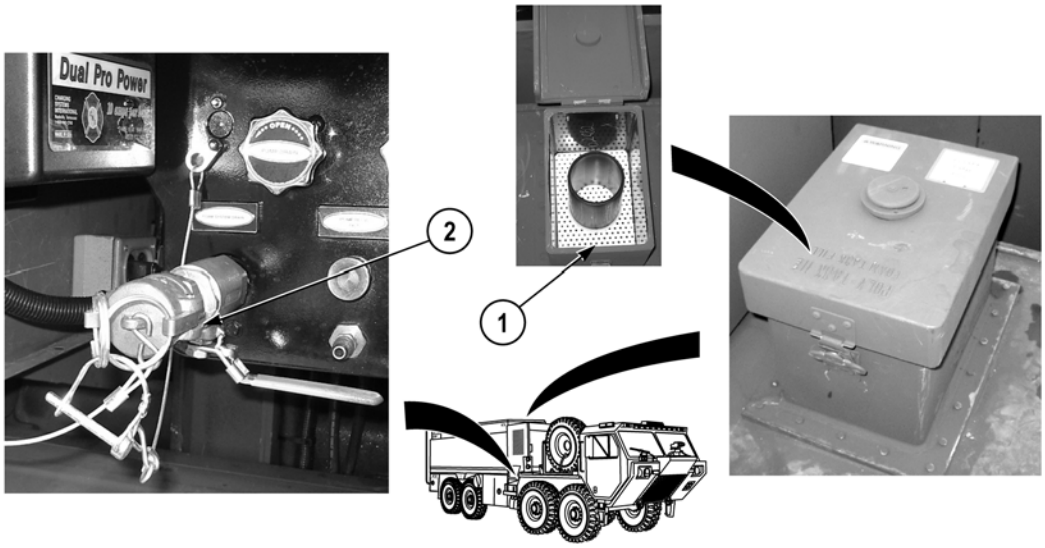
- Foam system operation from cab (Bumper Turret Operation) requires system pressure of at least 185 to 195 psi (1,276 to 1,345 kPa) for proper proportion.
- Foam system operation from pump operator's panel requires system pressure of at least 125 to 250 psi (862 to 1,724 kPa) for proper proportion.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FOAM AGENT FILLING/DRAINING/FLUSHING

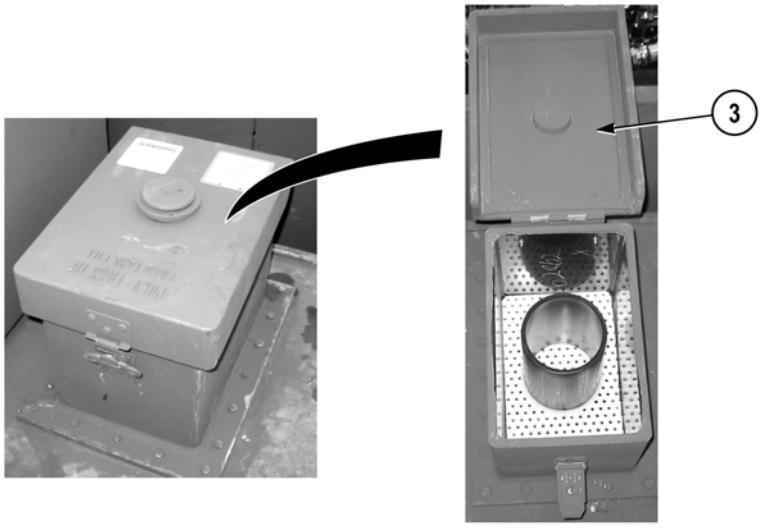
FILLING FOAM AGENT TANK



⚠ CAUTION

- **Do not mix different types or manufacturers' brands of foam agent in foam cell or piping. Mixing of different foam agents (either type or manufacturer) may cause deterioration of foam agent, improper proportioning, and poor performance in a fire situation. Mixing of Class A and different types of foam agents may result in a chemical reaction which can create globules, which can clog orifices and cause system failure.**
- **Do not spill foam agent on pressure/vacuum vents. Clean any spilled foam agent before continuing with procedures. If vents become blocked, pressure could build up in tanks and may cause damage to equipment.**

1. Vehicle should be parked on a level surface.
2. Ensure all water and other contaminants have been drained from foam tank (1) before filling.
3. Ensure FOAM SYSTEM DRAIN valve (2) is in CLOSED position.
4. Unstow right rear access ladder (WP 0012).



WARNING

Use extreme care when walking on top of vehicle. Be extra careful in wet, icy, or muddy conditions. Failure to comply may result in personnel slipping and falling causing injury or death to personnel.

5. Open expansion dome hatch (3).

WARNING

Caution must be taken when carrying 5 gal. (19 l) pails of foam agent to top of foam agent tank. If foam agent is spilled, walking surface can become extremely slippery. Clean any spilled foam agent before continuing to fill foam agent tank. Failure to comply may result in injury or death to personnel.

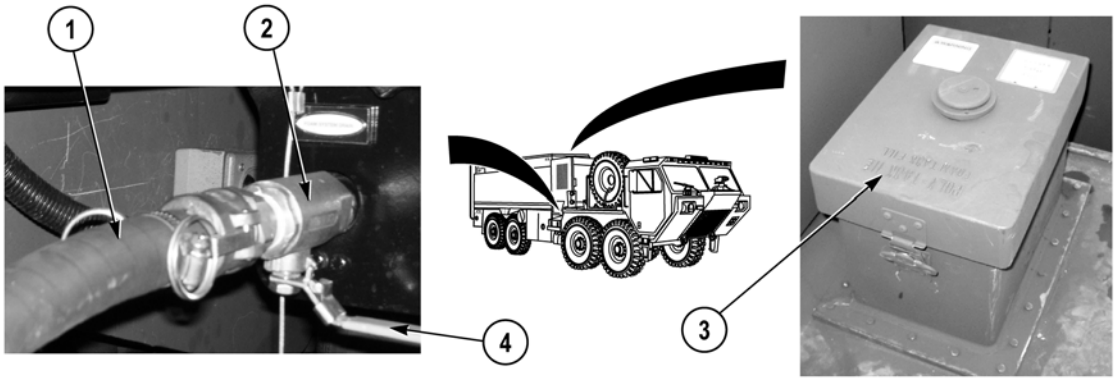
NOTE

- Foam cell should be filled halfway up into expansion dome to minimize surface area of foam agent subject to evaporation. Pour foam agent down center of round tube when filling tank. This tube goes to bottom of tank and allows foam agent to enter under surface of foam currently in tank. This is done to reduce aeration of foam agent per NFPA.
- Foam agent must be added by pouring through the 4 in. (10 cm) tube; it must be done slowly and carefully to prevent aeration. If aeration occurs inside tank, stop pouring until foam agent bubbles dissolve. Take care not to allow water, dirt, debris, or foreign substance to enter tank.

6. Close expansion dome hatch (3).
7. Stow right rear access ladder (WP 0012).

END OF TASK

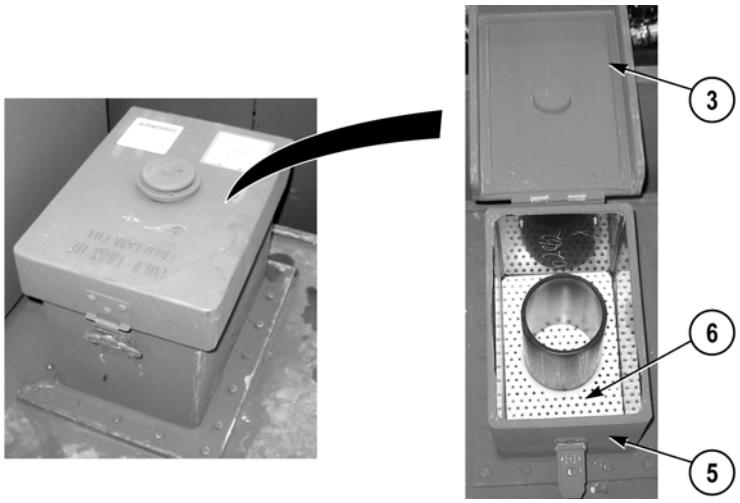
DRAINING/FLUSHING FOAM AGENT TANK



NOTE

Foam drained from foam tanks will need to be drained into properly marked and sealed containers.

1. Gather suitable containers.
2. Remove cap and attach drain hose (1) to FOAM SYSTEM DRAIN valve (2).
3. Open expansion dome hatch (3).
4. Put FOAM SYSTEM DRAIN valve handle (4) to open position and completely drain foam into containers.
5. Put FOAM SYSTEM DRAIN valve handle (4) to closed position.

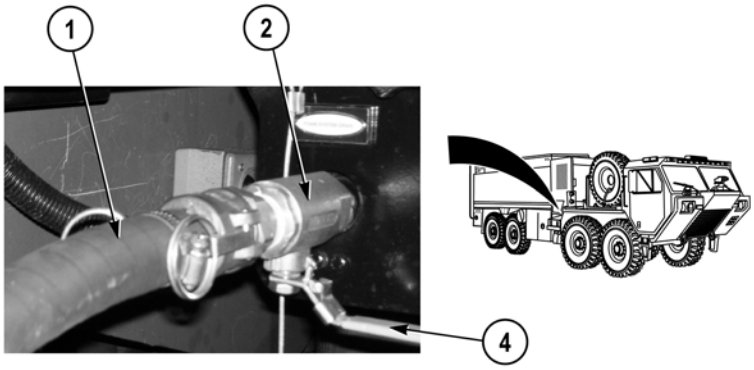


6. Properly label sealed containers when foam is completely drained from foam tank (5).
7. Remove fill tower screen (6) from foam tank (5).

NOTE

- Defoaming agent can be used to assist in cleaning foam tanks.
- Defoaming agent and water must be added into foam tank that is being flushed.

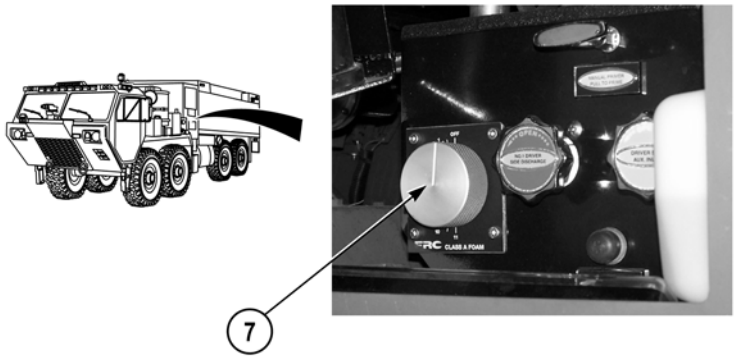
8. Add defoaming agent into foam tank (5).
9. Fill foam tank (5) with warm water.



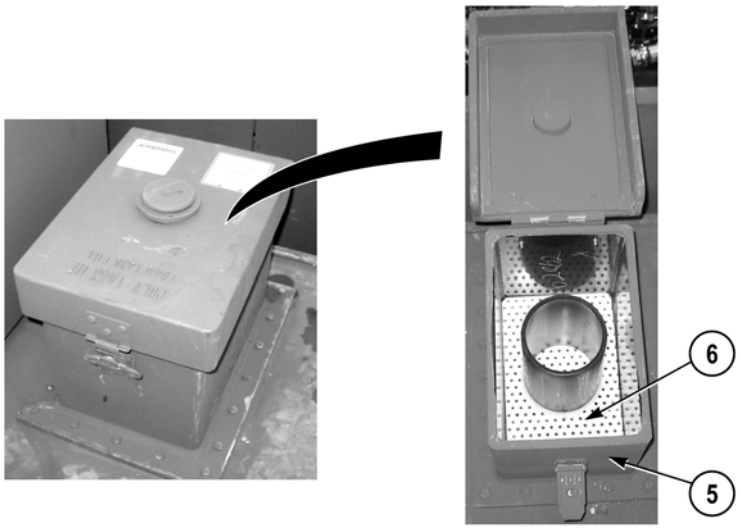
NOTE

Local drainage laws must be followed when draining and flushing foam and water from foam tanks.

10. Turn FOAM TANK DRAIN valve handle (4) to open position and drain water from foam tank (5).
11. Repeat Steps (8) through (10) until water runs clear.
12. Turn FOAM TANK DRAIN valve handle (4) to closed position and install cap.
13. Remove drain hose (1) from FOAM SYSTEM DRAIN valve (2) and install cap.



14. Turn foam manual METERING VALVE (7) to OPEN position.
15. Water must be added into foam tank (5) that is being flushed.
16. Run foam system with water instead of foam (WP 0023).
17. Discharge water until foam tank (5) is empty.
18. All debris must be removed from foam tank (5) after flushing is complete.



19. Install fill tower screen (6) in foam tank (5).
20. Close expansion dome hatch (3).
21. Flush foam system (WP 0028).

END OF TASK

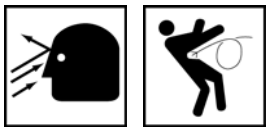
END OF WORK PACKAGE

OPERATOR MAINTENANCE

FOAM SYSTEM AND INSTRUMENT PANEL STANDBY MODE

FOAM SYSTEM - STANDBY MODE

WARNING



Open and close all valves slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Ensure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in serious injury or death to personnel and damage to equipment.

CAUTION

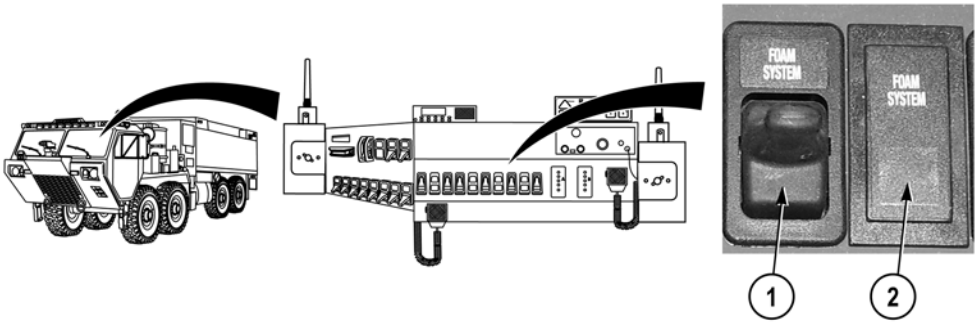
Turn on foam system only when needed. Failure to comply may result in damage to equipment.

NOTE

When in foam mode, never open TANK FILL & RE-CIRCULATING LINE valve control. This will cause foam agent to enter water tank. If recirculation is needed to keep pump cool, open PUMP COOLER valve.

Foam system is in Standby Mode when:

1. Drains are closed.
2. Vents not blocked and clean.
3. No known leaks.
4. Foam tanks are full.
5. Latches are secured.

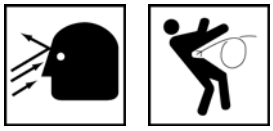


6. FOAM SYSTEM switch (1) is in off position. Indicator light (2) will be out.

END OF TASK

INSTRUMENT PANEL - STANDBY MODE

WARNING



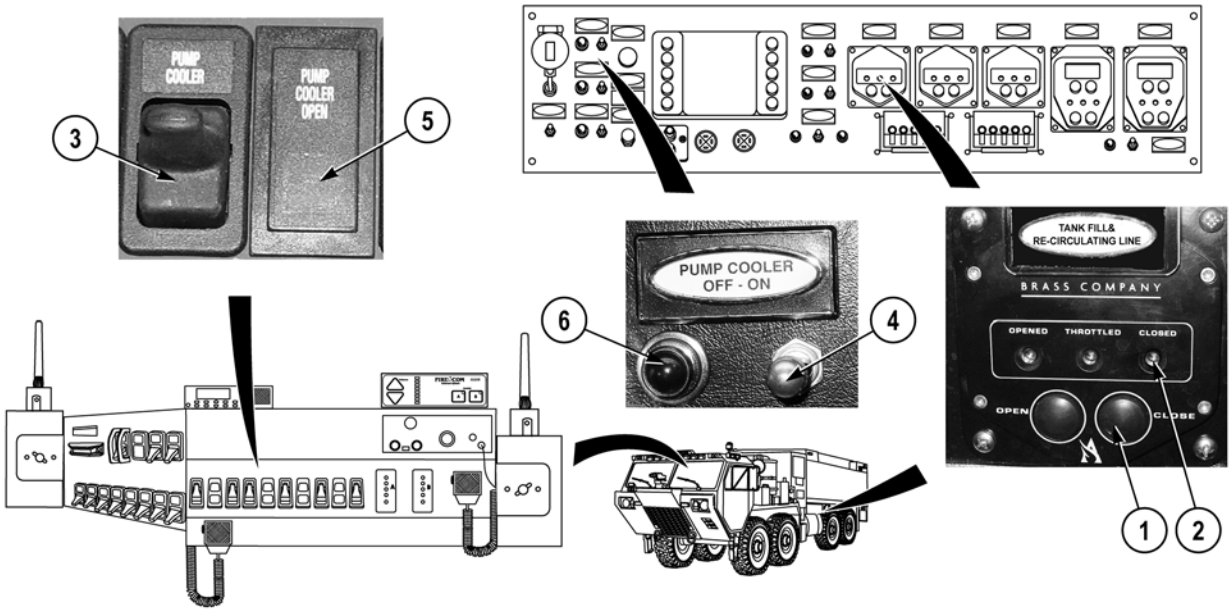
Open and close all valves slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Ensure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in serious injury or death to personnel and damage to equipment.

NOTE

For operation of pump, most controls and procedures will be the same whether pumping from tank, draft, or hydrant.

Operator must ensure that:

1. ALL water discharge valve controls are in CLOSED position.
2. ALL water inlet valve controls are in CLOSED position.
3. ALL drains are in CLOSED position.
4. ALL foam controls are in CLOSED/OFF position.
5. ALL inlet and outlet ports capped.



NOTE

Valve is completely closed when red indicator light illuminates.

6. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (1) until red indicator light (2) illuminates.

7. Put cab PUMP COOLER switch (3) and Pump Operator's Panel PUMP COOLER switch (4) to OFF position. Two indicator lights (5) and (6) will go out.

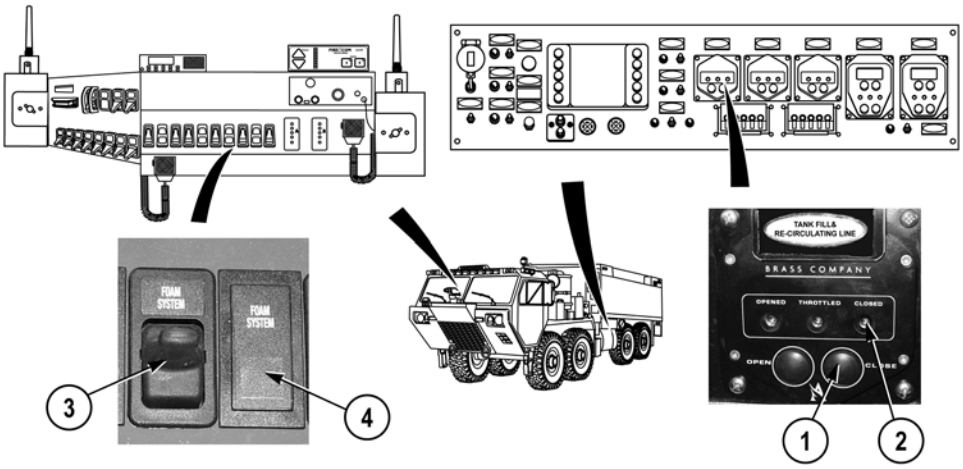
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FOAM SYSTEM OPERATING PROCEDURES (CAB AND PUMP OPERATOR'S PANEL)

STARTING FOAM SYSTEM OPERATION (CAB INSTRUMENT PANEL)



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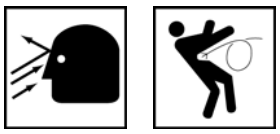


- **Before operating foam system, personnel must familiarize themselves with all procedures and instructions regarding water pump, discharge devices, and foam making devices. Failure to understand and follow any instructions could result in personal injury and/or damage to equipment.**
- **Open and close all valves slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Make sure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in injury or death to personnel and damage to equipment.**

NOTE

When foam system is operated from personnel cab, foam solution is present at bumper turret and under truck nozzles.

1. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (1) until red indicator light (2) illuminates.
2. Put FOAM SYSTEM switch (3) to on position. Indicator light (4) will illuminate.
3. Establish water flow to desired discharge outlets, (WP 0026) or (WP 0027).

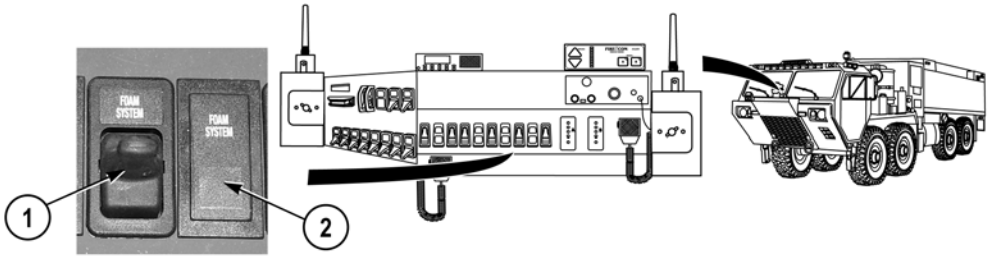
NOTE

- Foam system agent percentage is preset for bumper turret and under truck nozzles and is not adjustable.
- The foam system will discharge class A foam at 0.5% at 200 to 210 psi (1,379 to 1,448 kPa). At pressures lower than 200 psi (1,379 kPa), the foam concentrate will be higher.

4. Use pressure governor to adjust discharge pressure to desired pressure (WP 0016).

END OF TASK

STOPPING FOAM SYSTEM OPERATION (CAB INSTRUMENT PANEL)



1. Put FOAM SYSTEM switch (1) to off position. Indicator light (2) will go out.
2. Using pressure governor, decrease water pressure (WP 0016).
3. Perform foam system flushing procedure (WP 0028).

END OF TASK

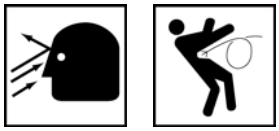
FOAM SYSTEM DEACTIVATION/CLEAN-UP

1. Set pressure governor to idle (WP 0016).
2. Perform appropriate foam system flushing procedure (WP 0028).

END OF TASK

STARTING FOAM SYSTEM OPERATION (PUMP OPERATOR'S PANEL)

WARNING



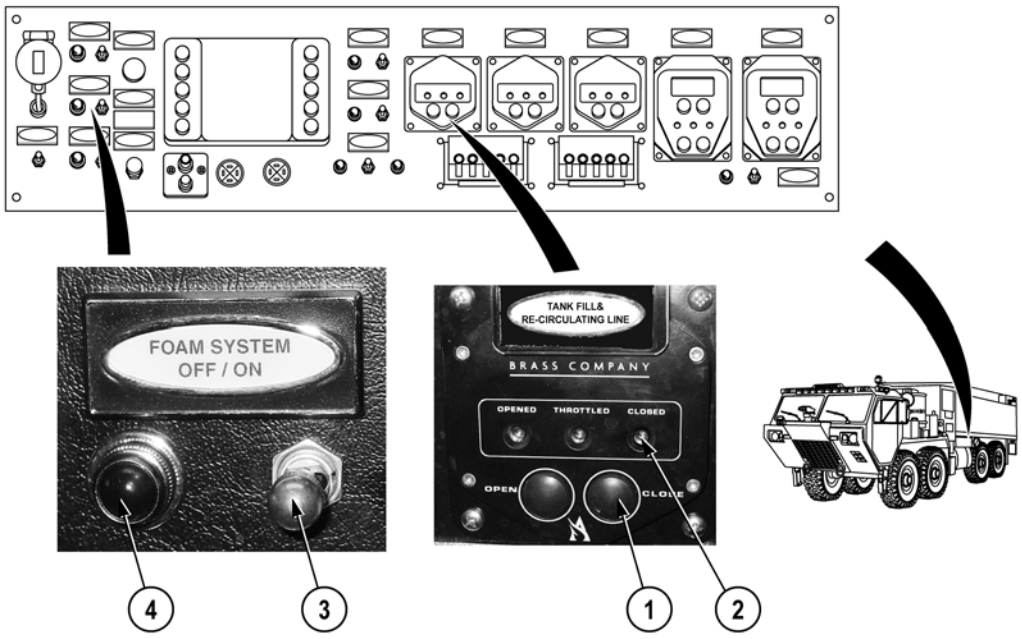
- **Before operating foam system, personnel must familiarize themselves with all procedures and instructions regarding water pump, discharge devices, and foam making devices. Failure to understand and follow any instructions could result in personal injury and/or damage to equipment.**
- **Open and close all valves slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Make sure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in injury or death to personnel and damage to equipment.**

CAUTION

When in foam mode, never open TANK FILL & RE-CIRCULATION LINE valve control. This will cause foam agent to enter water tank. If recirculation is needed to keep pump cool, open PUMP COOLER valve.

NOTE

Foam system operation from pump operator's panel requires system pressure of at least 125 to 250 psi (862 to 1,724 kPa) for proper proportion.



NOTE

Valve is completely closed when red indicator light illuminates.

1. Prepare vehicle for required pumping operation.
2. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (1) until red indicator light (2) illuminates.
3. Put FOAM SYSTEM switch (3) to ON position. Indicator light (4) will illuminate.

NOTE

If operating from a hydrant source, check pump intake pressure. Intake pressure must be 5 psi (34 kPa) or less, or proportioner will not function properly.

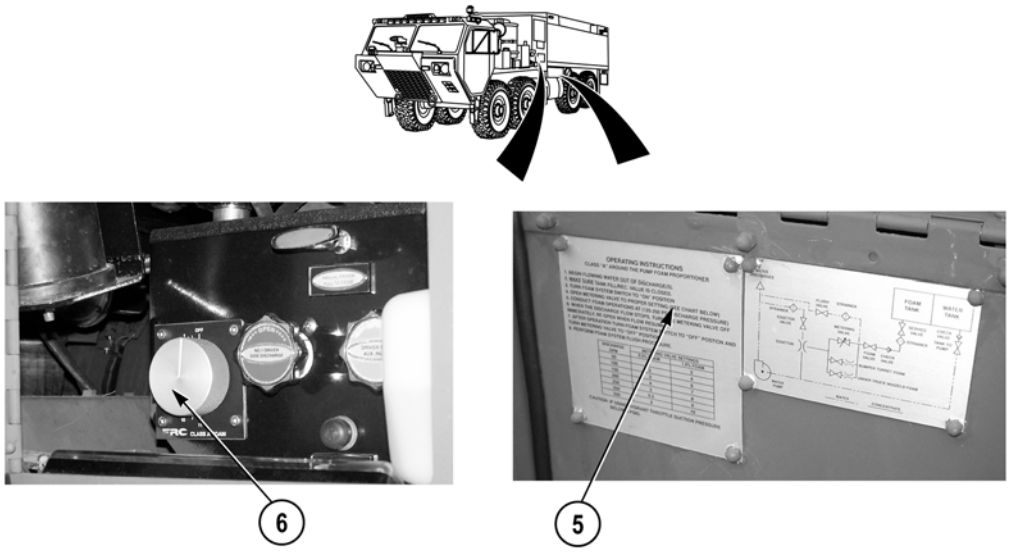
4. Establish water flow to desired discharge outlets (WP 0017), (WP 0018), (WP 0019).

⚠ CAUTION

If water is stopped, metering valve must be closed to prevent foam agent from entering piping and water pump. Failure to comply may result in damage to equipment.

NOTE

- Instruction plate mounted inside pump operator's panel cover gives settings versus flow rates for various agents.
- Each time flow rate is changed, manual METERING VALVE must be reset.
- The sum of all discharges being used must be added together for total GPM discharge.



5. Using chart (5), determine flow rate and set manual METERING VALVE (6) to deliver proper percentage.
6. Complete mission.

END OF TASK

STOPPING FOAM SYSTEM OPERATION (PUMP OPERATOR'S PANEL)

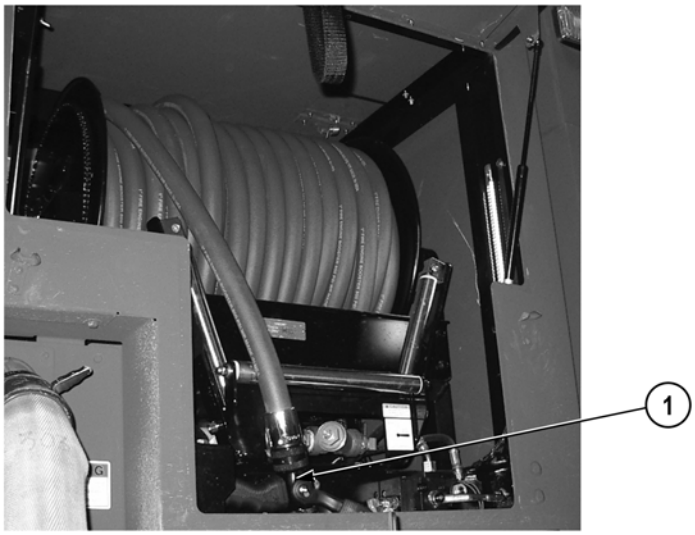
1. Turn manual METERING VALVE (6) to CLOSED position.
2. Using pressure governor, decrease water pressure (WP 0016).
3. Perform foam system flushing procedures (WP 0028).

END OF WORK PACKAGE

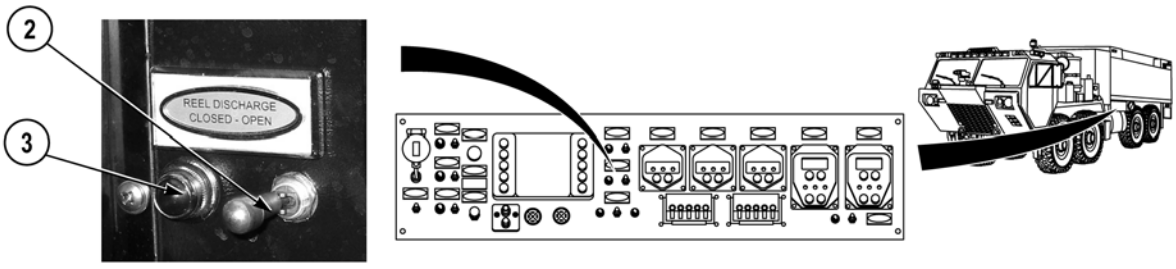
OPERATOR MAINTENANCE

HOSE REEL OPERATION

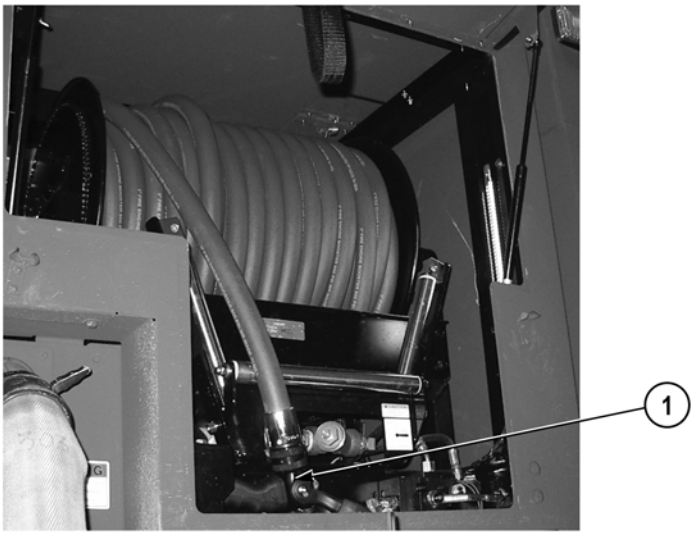
HOSE REEL OPERATION



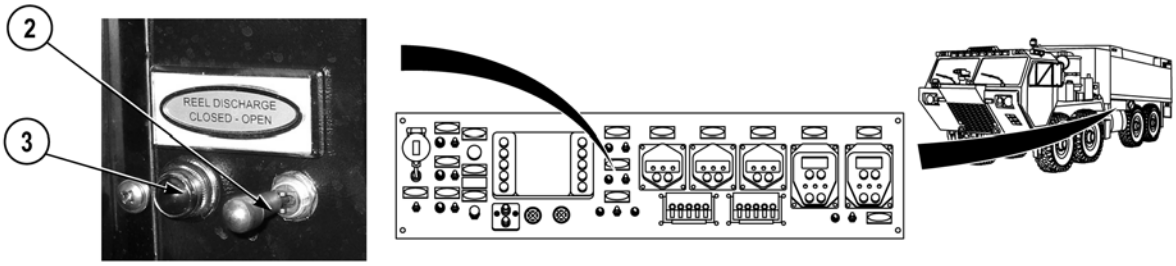
1. Prepare vehicle for required pumping operation (WP 0017), (WP 0018), or (WP 0019).
2. Open pump house lower access door (WP 0009).
3. Manually pull hose nozzle (1) to desired location.



4. Put REEL DISCHARGE switch (2) to OPEN position. Indicator light (3) will illuminate.



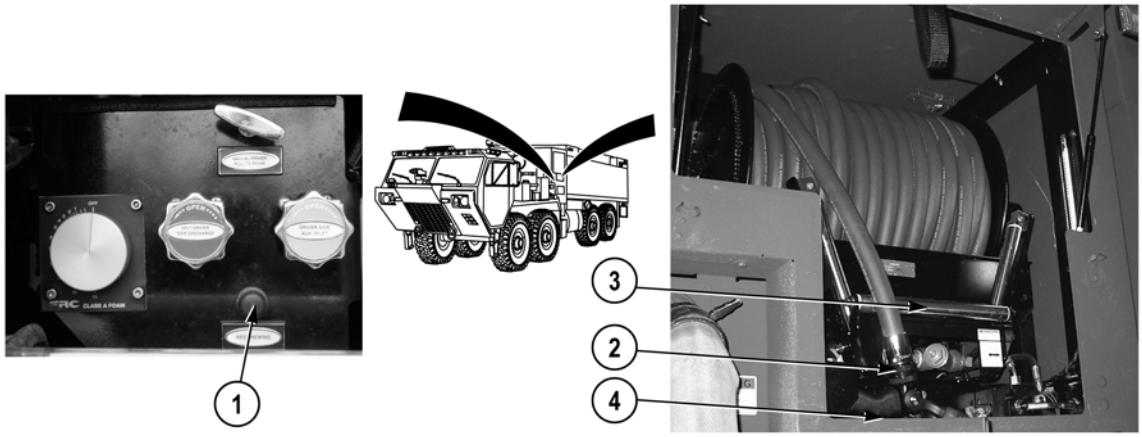
5. Open hose nozzle (1).
6. Complete mission.
7. Close hose nozzle (1).



8. Put REEL DISCHARGE switch (2) to CLOSED position. Indicator light (3) will go out.
9. Shut off water supply control valve (WP 0017), (WP 0018), or (WP 0019).
10. Put REEL DISCHARGE switch (2) to OPEN position. Indicator light (3) will illuminate.
11. Open hose nozzle valve (1) to relieve pressure.
12. When pressure is relieved, close hose nozzle valve (1).
13. Put REEL DISCHARGE switch (2) to CLOSED position. Indicator light (3) will go out.

END OF TASK

STOWING HOSE ON HOSE REEL (POWERED REWIND)



WARNING

When rewinding hose using powered operation, hose will rewind quickly. Keep hands away from hose when rewinding. Failure to comply may result in serious injury to personnel.

NOTE

If REEL REWIND button does not operate, refer to WP 0035 for manual rewind operations.

1. Push and hold hose REEL REWIND button (1).
2. When hose nozzle (2) reaches hose reel guide roll (3), release hose REEL REWIND button (1).
3. Stow hose nozzle (2) in nozzle stowage area (4).
4. Close pump house lower access door (WP 0009).

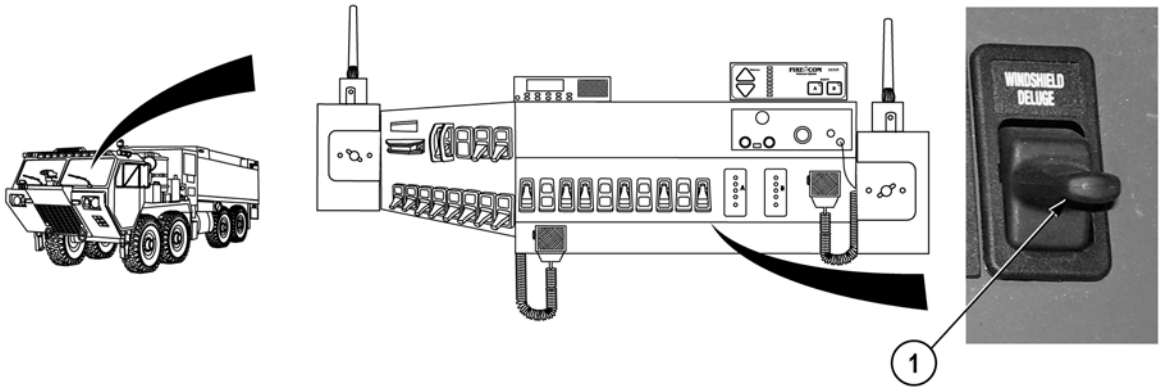
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

WINDSHIELD DELUGE OPERATION

STARTING WINDSHIELD DELUGE SYSTEM



1. Ensure there is water in water tank.
2. Put WINDSHIELD DELUGE switch (1) to on position.

END OF TASK

STOPPING WINDSHIELD DELUGE SYSTEM

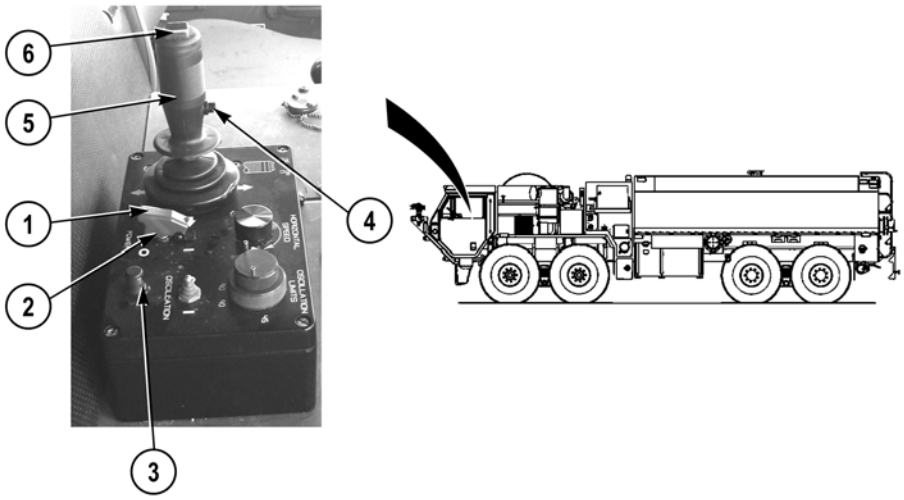
Turn WINDSHIELD DELUGE switch (1) to off position.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

BUMPER TURRET OPERATION



WARNING

Turret should never be pointed at personnel. Failure to comply may result in injury or death to personnel.

NOTE

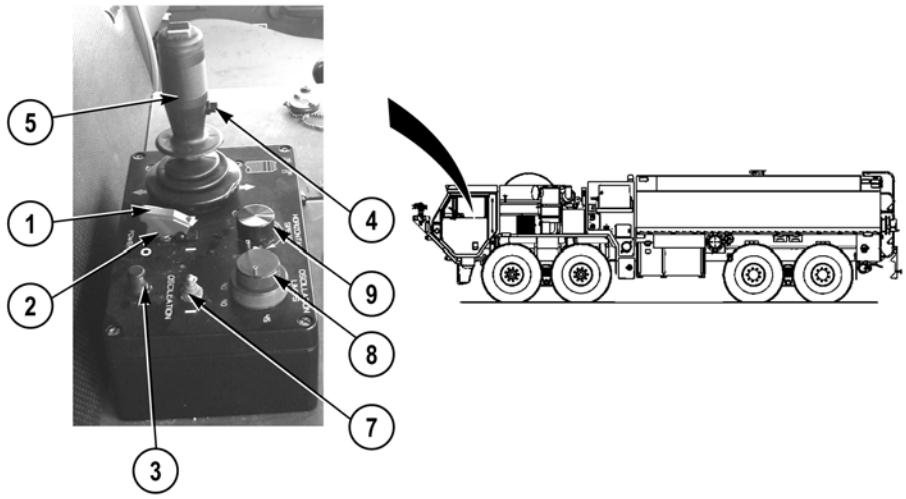
Bumper turret is controlled from inside personnel cab by using joystick control box.

1. Lift power switch guard (1) and put power switch (2) to **|** (on) position. Indicator light (3) will illuminate.
2. Push and release agent discharge control button (4) on front of joystick control handle (5) to begin discharge.

NOTE

Pattern control button, located on top of joystick, controls nozzle discharge pattern. Pressing switch to left changes nozzle pattern to fog pattern. Pressing switch to right changes nozzle pattern to straight stream.

3. Press pattern control button (6) to desired pattern.



NOTE

- Perform Steps (4) through (6) to activate automatic oscillation.
- The joystick control handle is designed to override the automatic oscillation. Moving the joystick left or right will automatically disengage automatic oscillation. The bumper turret nozzle can be elevated or depressed when in automatic oscillation, and automatic oscillation will not disengage.

4. Put OSCILLATION switch (7) to **|** (on) position.
5. Set OSCILLATION LIMITS control knob (8) to desired position.
6. Set HORIZONTAL SPEED (9) to desired position.
7. Complete mission.
8. Push and release agent discharge control button (4) on front of joystick (5) to stop discharge.
9. Put OSCILLATION switch (7) to ○ (off) position.
10. Put POWER switch (2) to ○ (off) position and lower power switch guard (1). Indicator light (3) will go out.

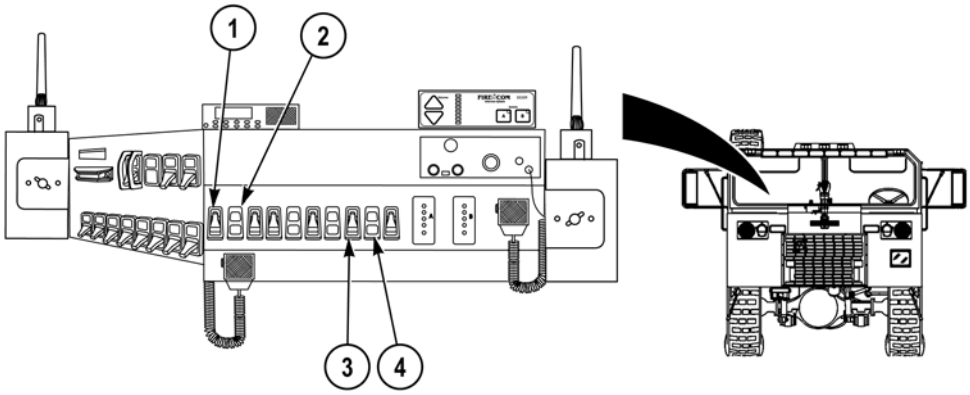
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

UNDER TRUCK NOZZLES AND PUMP AND ROLL/DRIVE OPERATIONS

STARTING UNDER TRUCK NOZZLES AND PUMP AND ROLL/DRIVE OPERATIONS



WARNING

- **Pump and roll/drive procedures must be performed from inside cab. Do not use pump operator's panel for pump and roll/drive procedures. Failure to comply may result in injury or death to personnel.**
- **Due to poor driver visibility to curbside of vehicle over doghouse and cab mounted equipment, a crew member must be seated in passenger seat when vehicle is in motion. Failure to comply may result in damage to equipment or injury or death to personnel.**

NOTE

- For maximum bumper turret performance maintain 200 to 210 psi (1,379 to 1,448 kPa) on pump discharge gauge.
- Vehicle must be operated in LO gear with engine speed at 1350 rpm or greater for pump and roll/drive operations.

1. Put TRANSFER CASE gear selector switch to LO position (TM 9-2320-279-10).
2. Put TANK TO PUMP switch (1) to on position. Indicator light (2) will illuminate.
3. Prime water pump (WP 0015).
4. Put UNDER TRUCK NOZZLES switch (3) to on position. Indicator light (4) will illuminate.

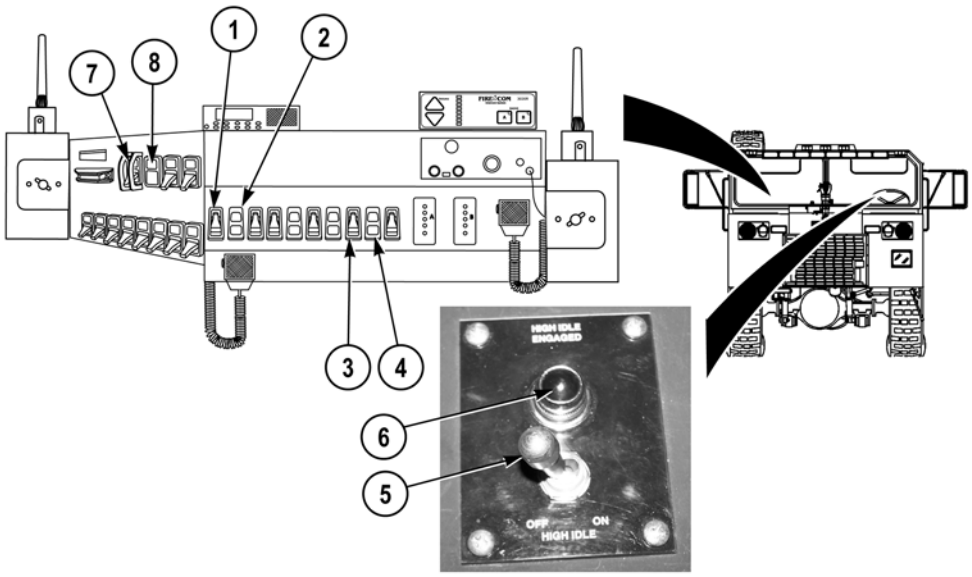
NOTE

For Foam System operations, refer to WP 0023.

5. Perform mission.

END OF TASK

STOPPING UNDER TRUCK NOZZLE AND PUMP AND ROLL/DRIVE OPERATIONS



NOTE

Perform Step (1) if foam system operations were required.

1. Turn foam system off (WP 0023).
2. Put UNDER TRUCK NOZZLES switch (3) to off position. Indicator light (4) will go out.
3. Put HIGH IDLE switch (5) to OFF position. Indicator light (6) will go out.
4. Put PUMP PTO switch (7) to off position. Indicator light (8) will go out.
5. Put TANK TO PUMP switch (1) to off position. Indicator light (2) will go out.

NOTE

Perform Step (6) if foam system operations were required.

6. Perform foam system flushing procedures (WP 0028).
7. If mission complete, perform post operation procedures (WP 0029).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FOAM SYSTEM FLUSHING

FOAM AGENT PIPING FLUSH PROCEDURE

WARNING

Open and close all valves slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Make sure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in injury or death to personnel and damage to equipment.

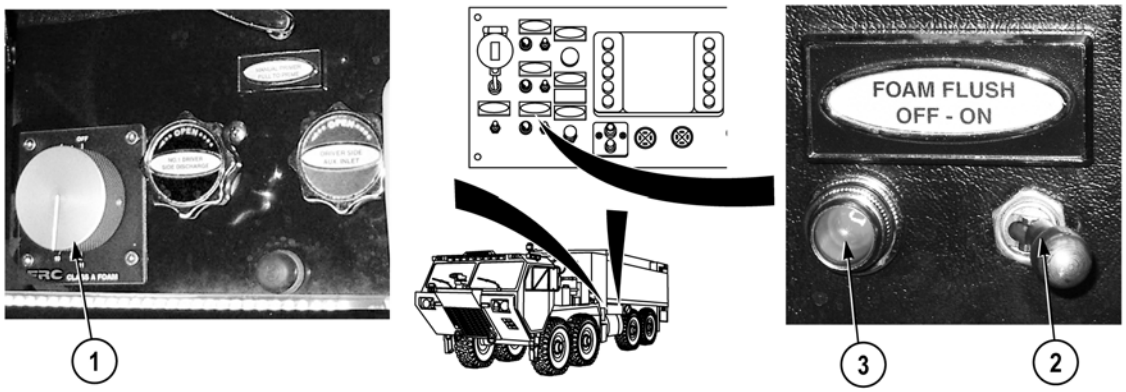
CAUTION

Foam agent can cause operating components, such as valves, to stick if solution is allowed to dry. Many types of foam agents have penetrating properties, which can remove or accelerate deterioration of greases and/or lubricants. Special attention should be given to lubrication requirements of equipment normally in contact with foam solution such as valves, monitors, nozzles, etc. More frequent lubrication may be necessary. It is recommended that the water pump and delivery system components be flushed before they are returned to a "ready" condition.

NOTE

- Close all valves once water runs clear.
- Foam system flushing procedure must be done using onboard water tank.

1. Using pressure governor, decrease water pressure (WP 0016).

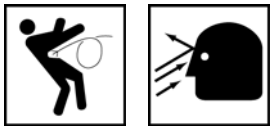


⚠ CAUTION

Do not open any foam agent supply tanks while performing flush procedures or damage to equipment may occur.

2. Ensure foam manual METERING VALVE (1) is in OFF position.
3. Using pressure governor, adjust water pump discharge pressure to 125 psi (862 kPa) (WP 0016).
4. Put FOAM FLUSH switch (2) to ON position. Indicator light (3) will illuminate.

WARNING



Open and close all valves slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Ensure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in injury or death to personnel and damage to equipment.

⚠ CAUTION

Do not allow foam system pressure to exceed 250 psi (1,724 kPa). Failure to comply may result in damage to equipment.

5. Put foam manual METERING VALVE (1) in fully OPEN position.

NOTE

Perform Steps (6) through (8) for discharges that were used.

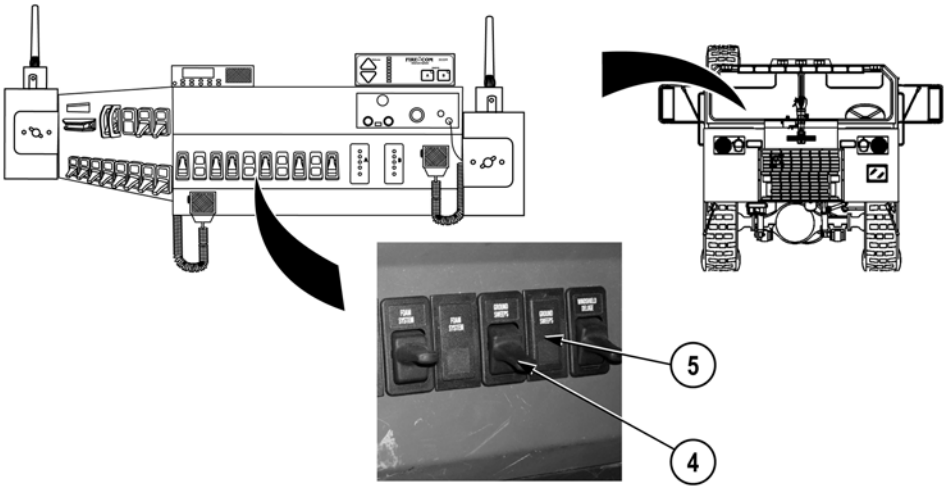
6. Open discharge valves and flush out all discharges that were used, removing foam until water runs clear.
7. While flushing, open and close foam manual METERING VALVE (1) at least twice or until water runs clear from discharge.

8. Flush portable equipment such as hoses, nozzles, monitors, etc.

NOTE

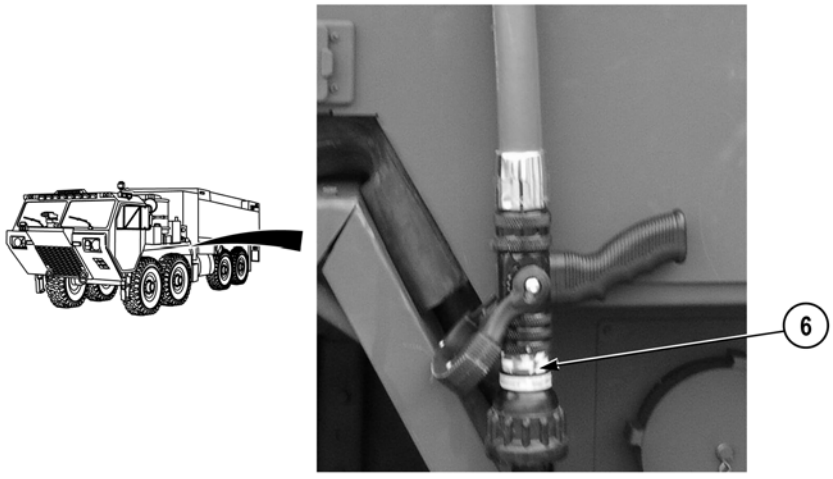
Perform the following steps to flush foam system piping from discharges that were not used.

9. Perform bumper turret discharge operations (WP 0026) until water runs clear from bumper turret discharge.



10. Put UNDER TRUCK NOZZLES switch (4) to on position. Indicator light (5) will illuminate.

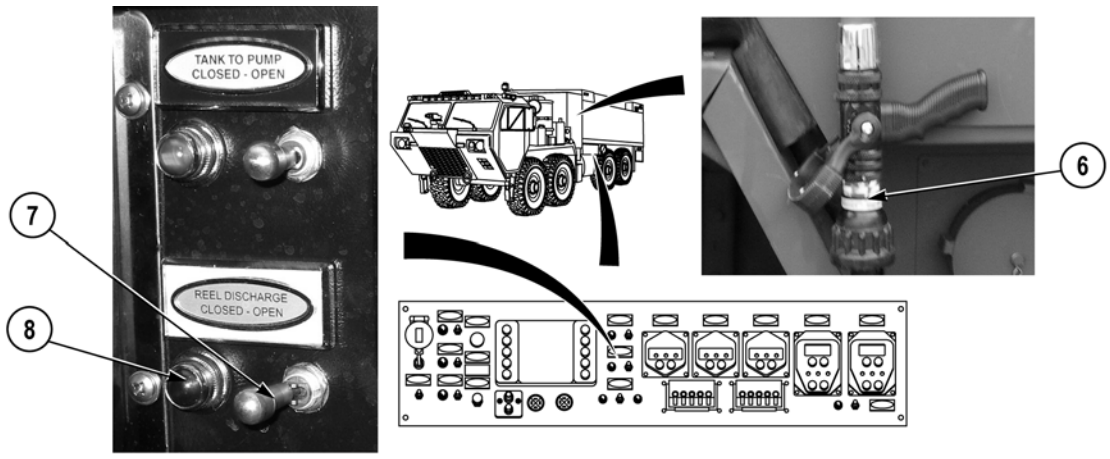
11. When water runs clear from under truck nozzles, put UNDER TRUCK NOZZLES switch (4) to off position. Indicator light (5) will go out.



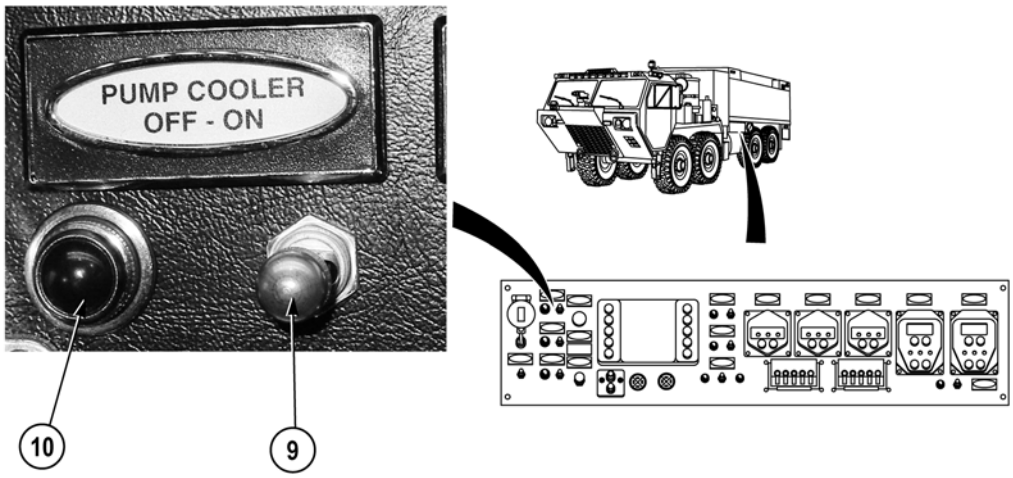
12. Open lower pump house access door (WP 0009).

13. Pull hose nozzle (6) away from truck to a suitable draining location.

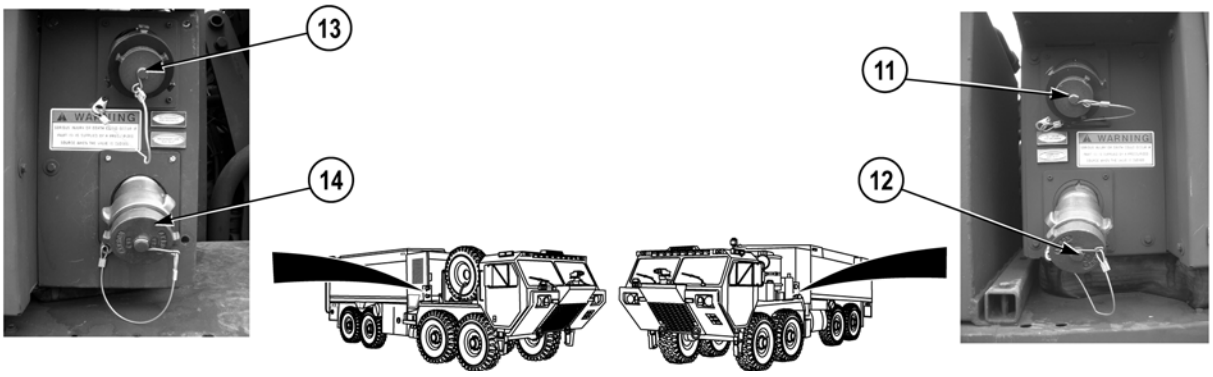
14. Open hose nozzle (6).



15. Put REEL DISCHARGE switch (7) to OPEN position. Indicator light (8) will illuminate.
16. When water runs clear from hose nozzle, put REEL DISCHARGE switch (7) to CLOSED position. Indicator light (8) will go out.
17. Close hose nozzle (6).
18. Stow hose on hose reel (WP 0024).
19. Close lower pump house access door (WP 0009).



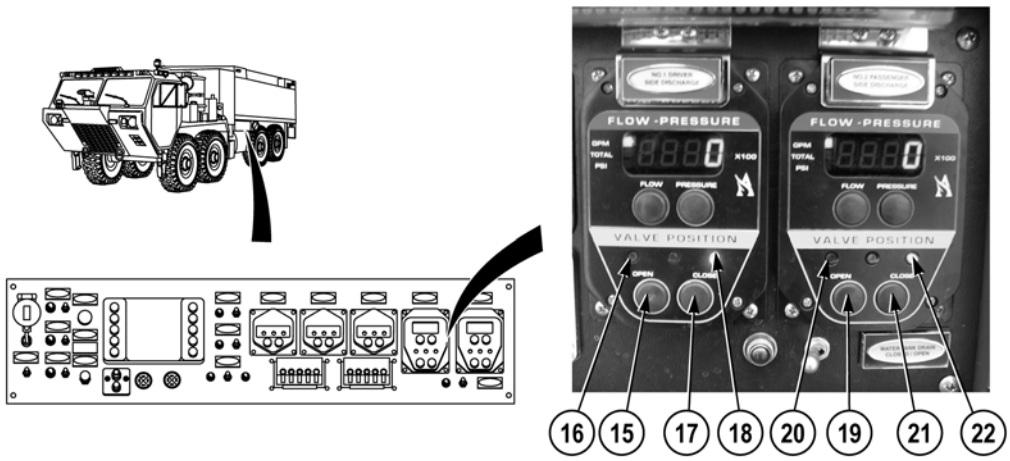
20. Put PUMP COOLER switch (9) to ON position. Indicator light (10) will illuminate.
21. When water runs clear, put PUMP COOLER switch (9) to OFF position. Indicator light (10) will go out.



WARNING

Discharge caps should not be removed if water system is pressurized. Discharge caps can act as projectiles if released under pressure, causing injury or death to personnel.

22. If not removed, remove caps from NO. 1 DRIVER SIDE DISCHARGE (11), DRIVER SIDE AUX. INLET (12), NO. 2 PASSENGER SIDE DISCHARGE (13), and PASSENGER SIDE AUX. INLET (14).

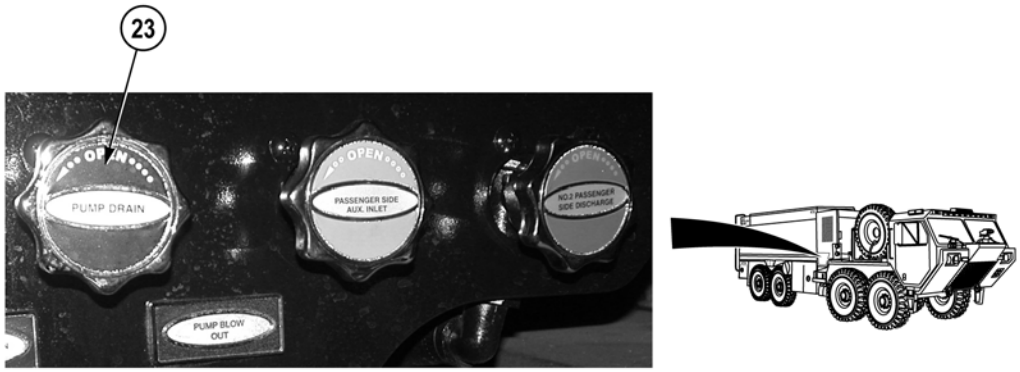


23. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (15) until green indicator light (16) illuminates.

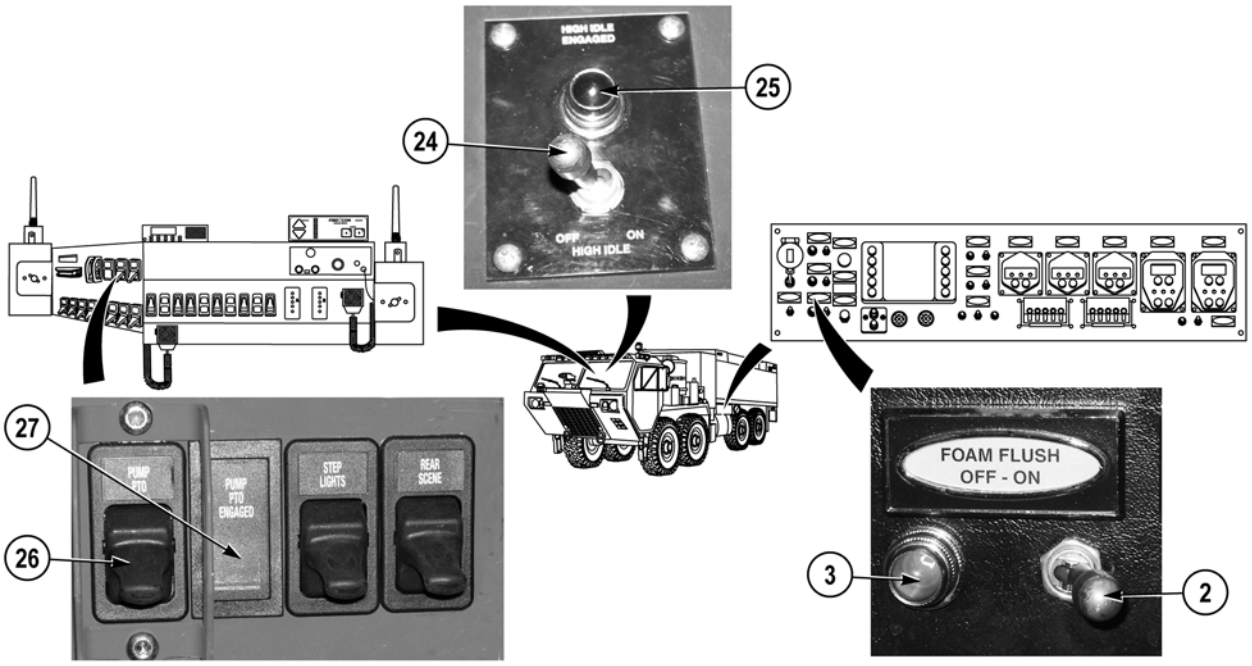
24. When water runs clear, push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (17) until red indicator light (18) illuminates.

25. Push NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN button (19) until green indicator light (20) illuminates.

26. When water runs clear, push NO. 2 PASSENGER SIDE DISCHARGE valve control CLOSE button (21) until red indicator light (22) illuminates.



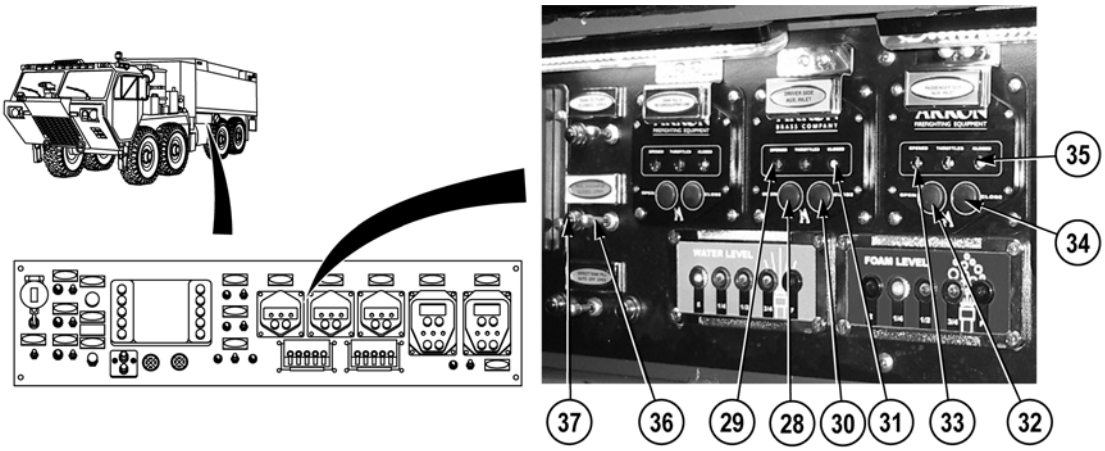
27. Open water PUMP DRAIN valve (23). When water runs clear, close water PUMP DRAIN valve (23).



28. Put FOAM FLUSH switch (2) to OFF position. Indicator light (3) will go out.

29. Put HIGH IDLE switch (24) to OFF position. Indicator light (25) will illuminate.

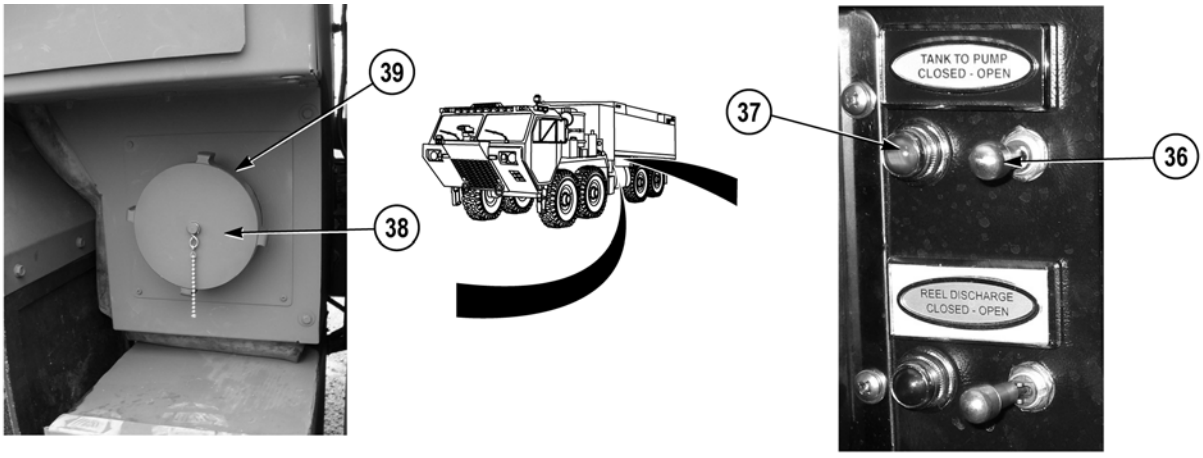
30. Put PUMP PTO switch (26) to off position. Indicator light (27) will go out.



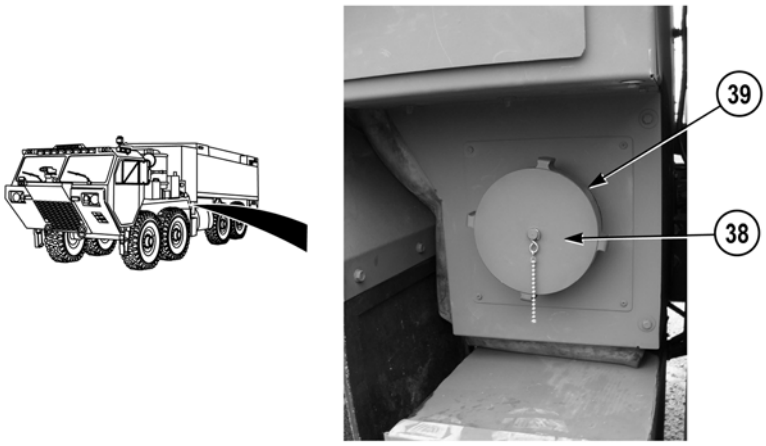
NOTE

- Valve is completely open when green indicator light illuminates.
- Valve is completely closed when red indicator light illuminates.

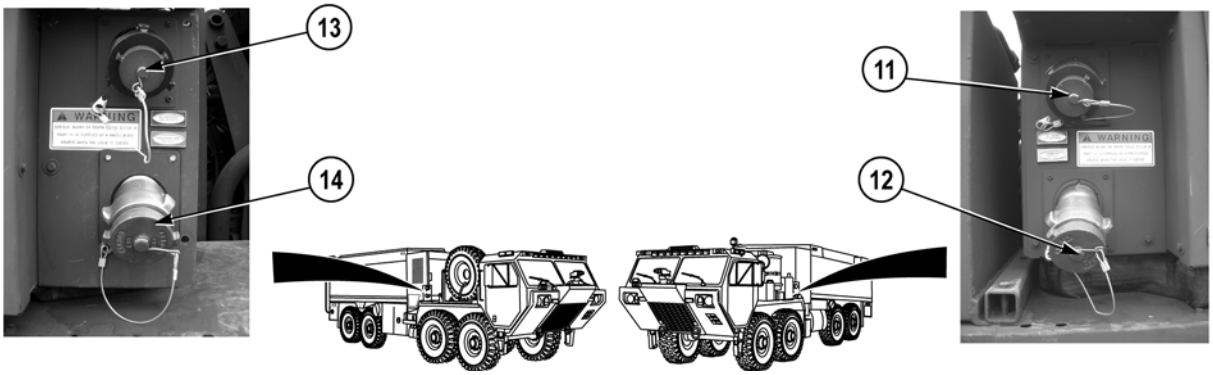
31. Push DRIVER SIDE AUX. INLET valve control OPEN button (28) until green indicator light (29) illuminates.
32. When water runs clear, push DRIVER SIDE AUX. INLET valve control CLOSE button (30) until red indicator light (31) illuminates.
33. Push PASSENGER SIDE AUX. INLET valve control OPEN button (32) until green indicator light (33) illuminates.
34. When water runs clear, push PASSENGER SIDE AUX. INLET valve control CLOSE button (34) until red indicator light (35) illuminates.



35. Put TANK TO PUMP switch (36) to OFF position. Indicator light (37) will go out.
36. Remove cap (38) from driver side main inlet (39).
37. Put TANK TO PUMP switch (36) in ON position. Indicator light (37) will illuminate.
38. When water runs clear from driver side main inlet, put TANK TO PUMP switch (36) to OFF position. Indicator light (37) will go out.



39. Install cap (38) on driver side main inlet (39).



40. Install caps on NO. 1 DRIVER SIDE DISCHARGE (11), DRIVER SIDE AUX. INLET (12), NO. 2 PASSENGER SIDE DISCHARGE (13), and PASSENGER SIDE AUX. INLET (14).

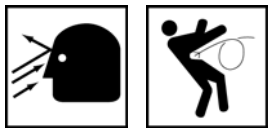
END OF WORK PACKAGE

OPERATOR MAINTENANCE

POST OPERATION PROCEDURES

1. If system was pumping seawater, dirty water, alkaline water, or foam, flush system with clean water (WP 0028).

WARNING



Ensure system pressure gauges and hose pressure gauges are at zero prior to disconnecting any suction or discharge hoses or removing caps. System operates at extreme pressure and failure to comply may result in injury or death to personnel.

2. Ensure all valves are in CLOSED position (WP 0004).

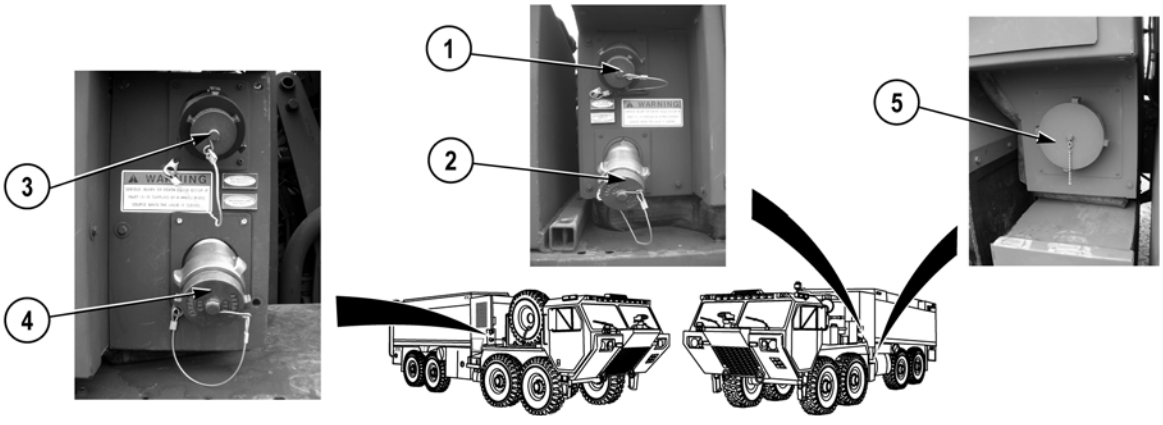
3. Disconnect and stow all suction and discharge hoses.

CAUTION

Pump and Plumbing Blowout Procedures (WP 0032) must be performed if vehicle is going to be stored outdoors in freezing weather. Failure to comply may cause damage to equipment.

NOTE

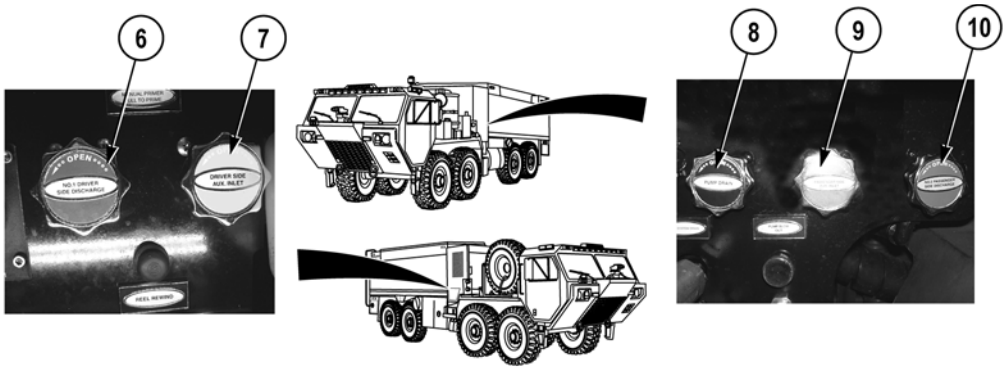
Perform Steps (4) through (11) if leaving vehicle in a “dry pump” condition (standby condition, dry condition, water tank full).



NOTE

Do not open TANK FILL & RE-CIRCULATING LINE valve control, TANK TO PUMP valve, WATER TANK DRAIN valve, FOAM valve, or FOAM FLUSH valve.

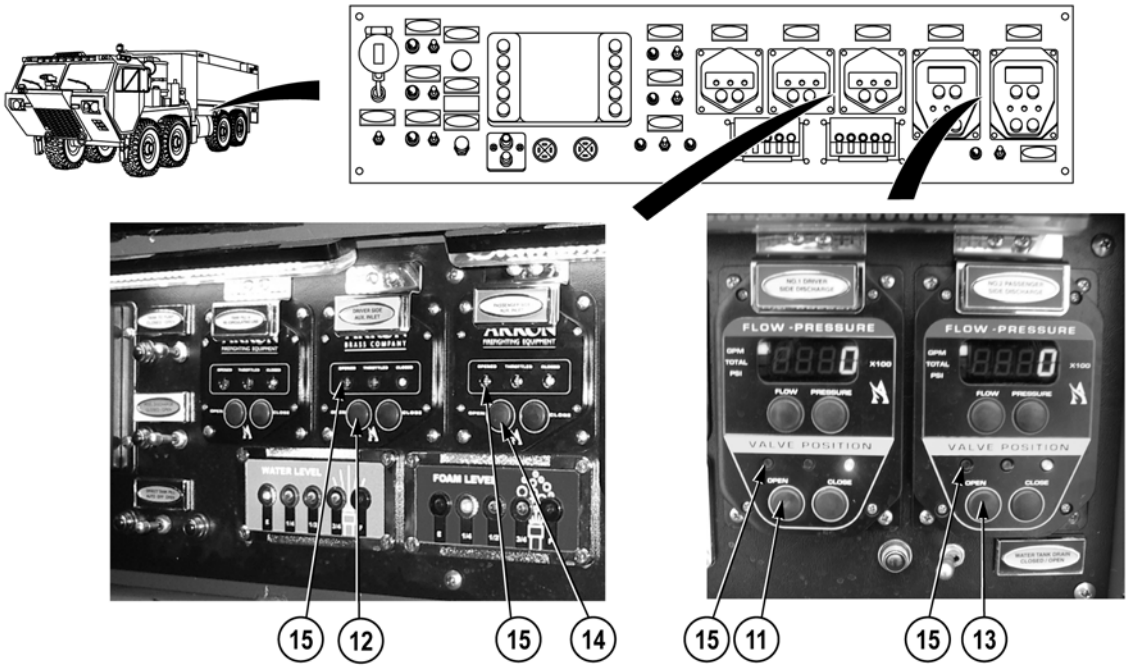
4. Remove NO. 1 DRIVER SIDE DISCHARGE cap (1), DRIVER SIDE AUX. INLET cap (2), NO. 2 PASSENGER SIDE DISCHARGE cap (3), PASSENGER SIDE AUX. INLET cap (4), and main inlet cap (5).



NOTE

Hand operated drain valves only open 1/4 turn.

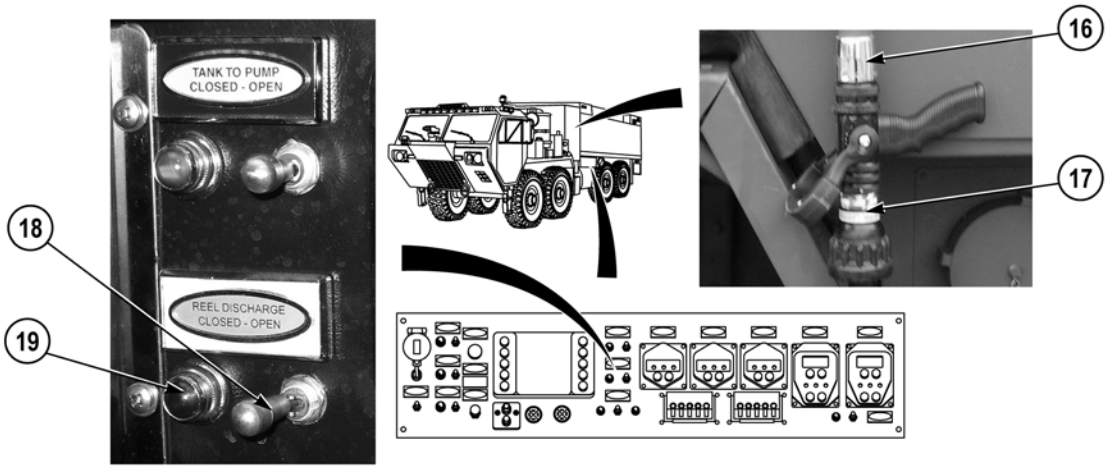
5. Open NO. 1 DRIVER SIDE DISCHARGE (6), DRIVER SIDE AUX. INLET (7), PUMP DRAIN (8), PASSENGER SIDE AUX. INLET (9), and NO. 2 PASSENGER SIDE DISCHARGE (10) drain valves.



NOTE

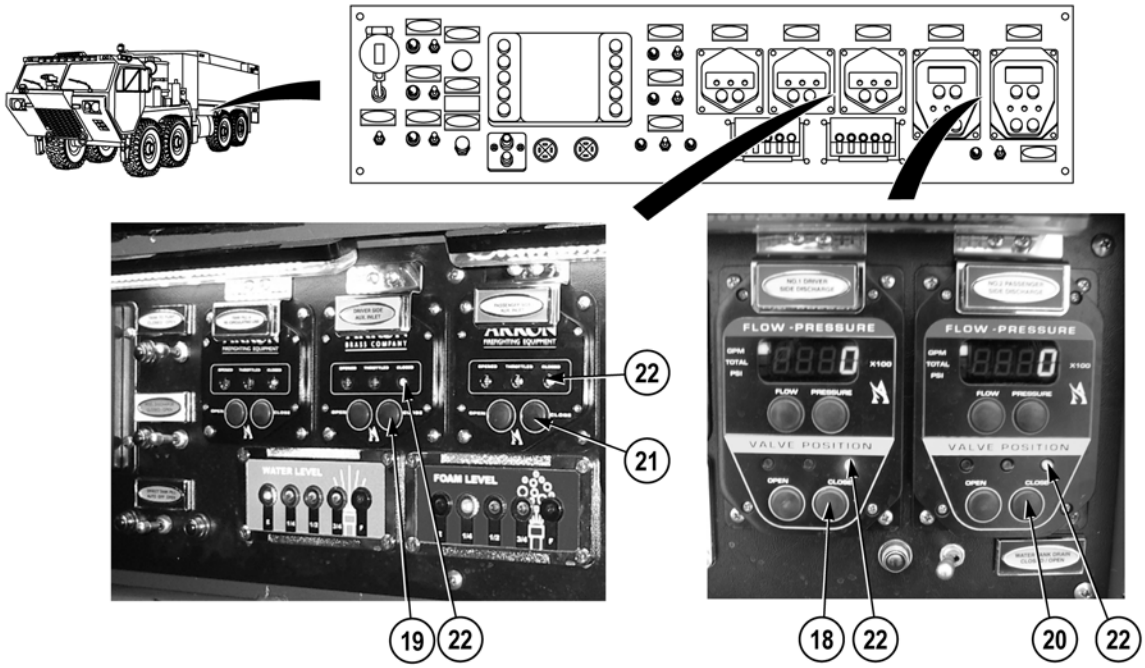
Valve is completely open when green indicator light illuminates.

6. Push NO. 1 DRIVER SIDE DISCHARGE valve control (11), DRIVER SIDE AUX. INLET valve control (12), NO. 2 PASSENGER SIDE DISCHARGE valve control (13), and PASSENGER SIDE AUX. INLET valve control (14) OPEN buttons until four green indicator lights (15) illuminate.

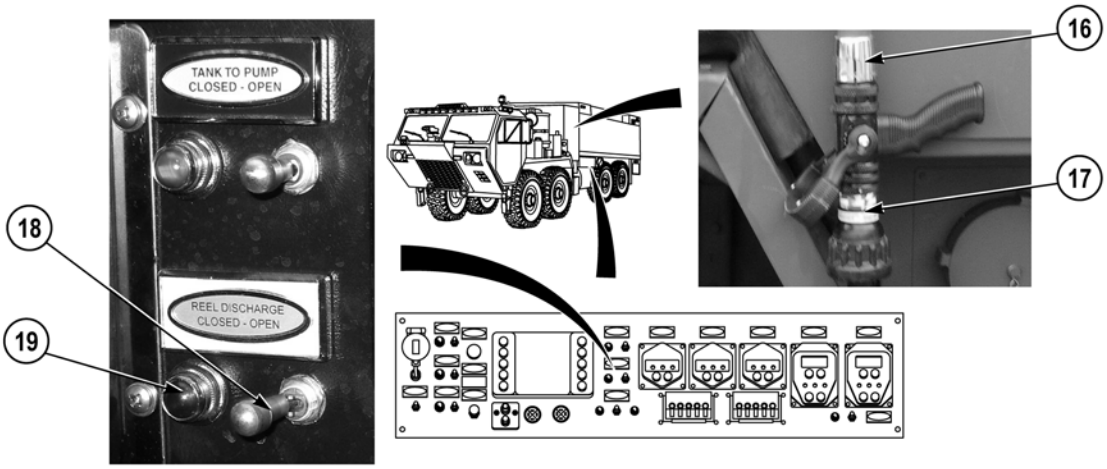


7. Pull reel discharge hose (16) from vehicle and open hose reel discharge nozzle (17).

8. Put REEL DISCHARGE switch (18) to OPEN position. Indicator light (19) will illuminate.

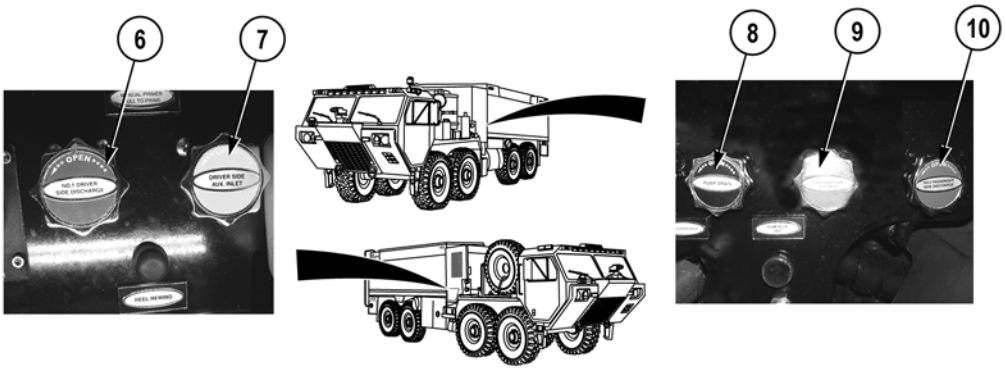


9. After pump is completely drained, push NO. 1 DRIVER SIDE DISCHARGE valve control (18), DRIVER SIDE AUX. INLET valve control (19), NO. 2 PASSENGER SIDE DISCHARGE valve control (20), and PASSENGER SIDE AUX. INLET valve control (21) CLOSE buttons until four red indicator lights (22) illuminate.

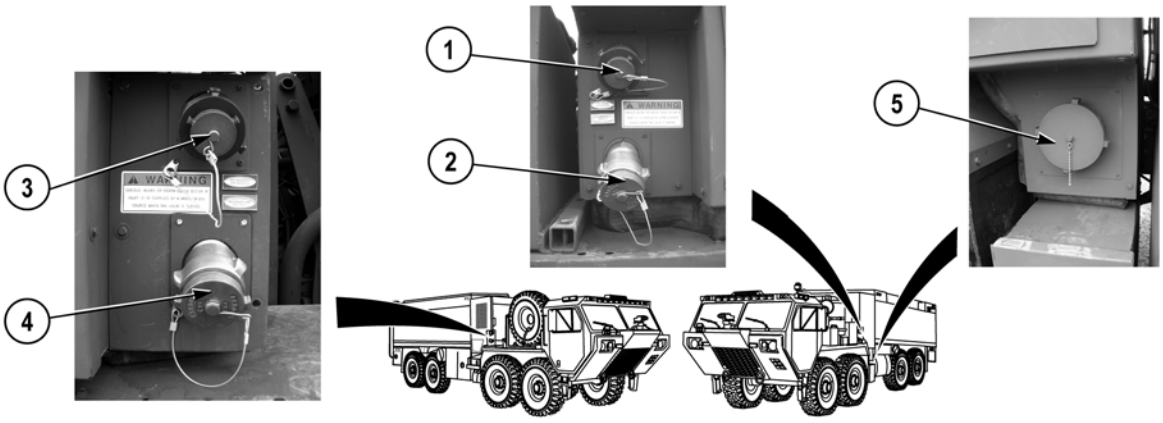


10. Put REEL DISCHARGE switch (18) to CLOSED position. Indicator light (19) will go out.

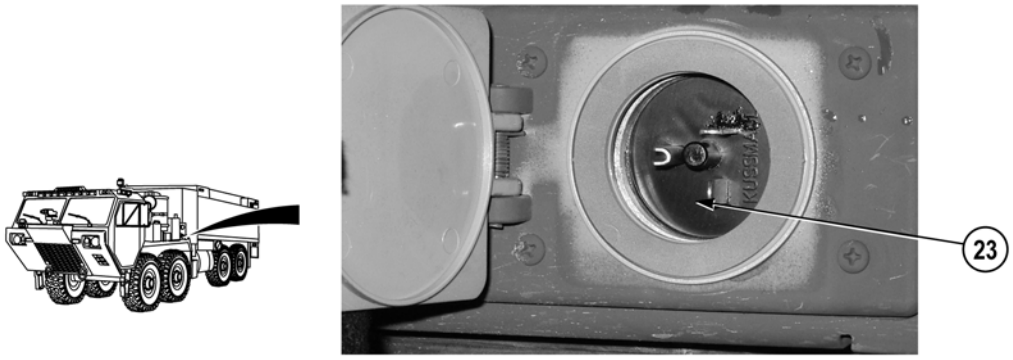
11. Close hose reel discharge nozzle (17) and stow hose (16) on hose reel (WP 0024).



12. Close NO. 1 DRIVER SIDE DISCHARGE (6), DRIVER SIDE AUX. INLET (7), PUMP DRAIN (8), PASSENGER SIDE AUX. INLET (9), and NO. 2 PASSENGER SIDE DISCHARGE (10) drain valves.



13. Install NO. 1 DRIVER SIDE DISCHARGE cap (1), DRIVER SIDE AUX. INLET cap (2), NO. 2 PASSENGER SIDE DISCHARGE cap (3), PASSENGER SIDE AUX. INLET cap (4), and main inlet cap (5).



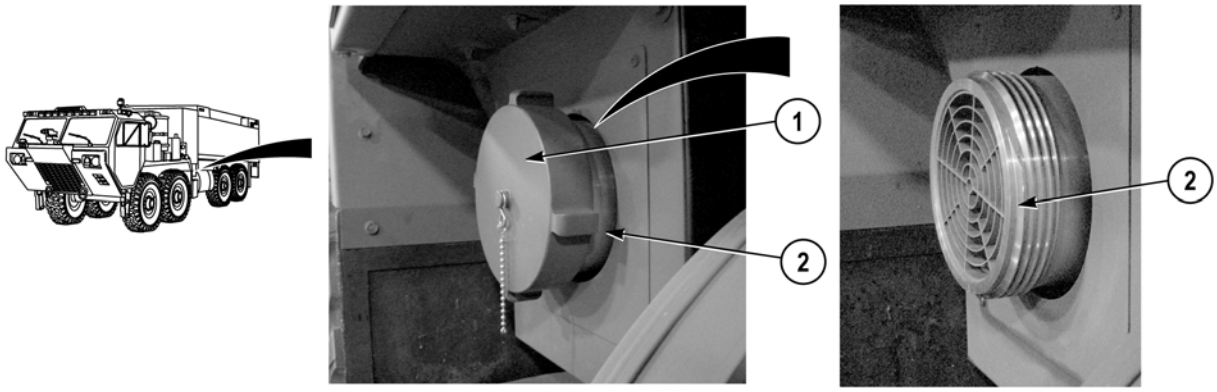
14. Connect power cord between HEWATT shoreline receptacle (23) and power source.
15. If required, follow Standard Operating Procedures (SOP) and fill out pump run log, indicating total pumping time and out-of-station time.
16. Report all pump, truck equipment malfunctions, and irregularities to your Supervisor.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

WATER PUMP AND WATER TANK FLUSH

WATER PUMP FLUSH



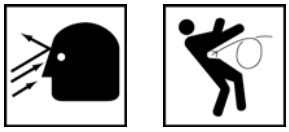
1. Remove cap (1) from driver side main inlet (2).

WARNING

Do not use hard suction hose. Hard suction hose will not hold pressure. Hose may fail and separate, causing injury to personnel and damage to equipment.

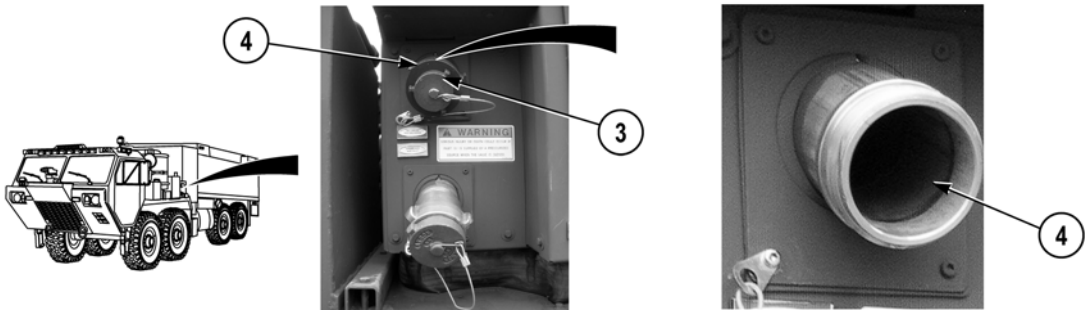
2. Connect 5 in. (13 cm) soft discharge hose to driver side main inlet (2) and positive water source.

WARNING



Open and close all valves slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Make sure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in injury or death to personnel and damage to equipment.

3. Open supply valve on positive water source.



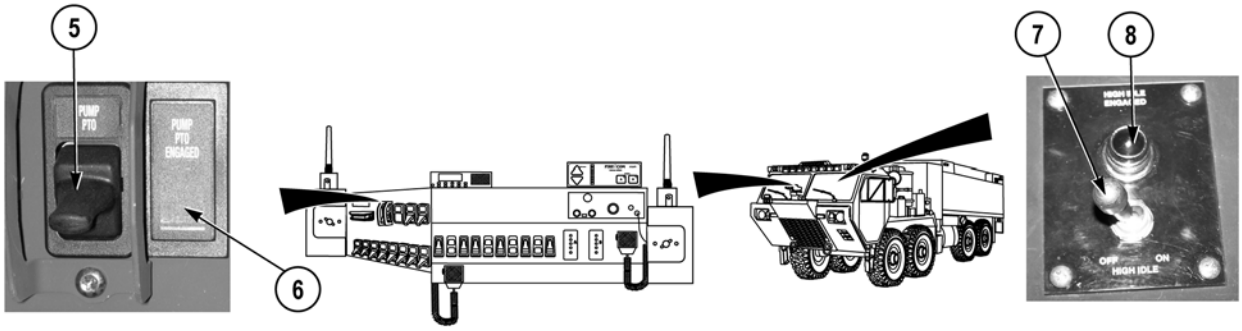
WARNING

Do not let pressure exceed 125 psi (862 kPa). Failure to comply may result in injury or death to personnel and/or damage to equipment.

NOTE

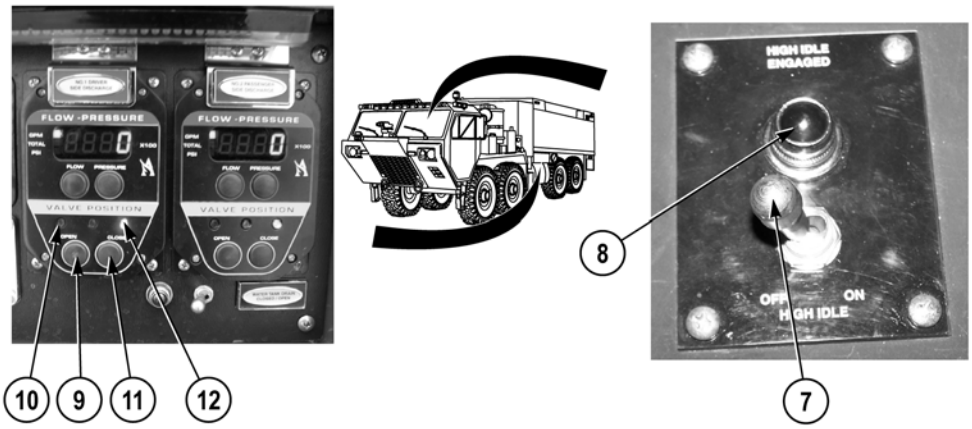
If pressure exceeds 125 psi (862 kPa) notify Supervisor.

4. Remove cap (3) from driver side discharge (4).



5. Put PUMP PTO switch (5) to on position. Indicator light (6) will illuminate.

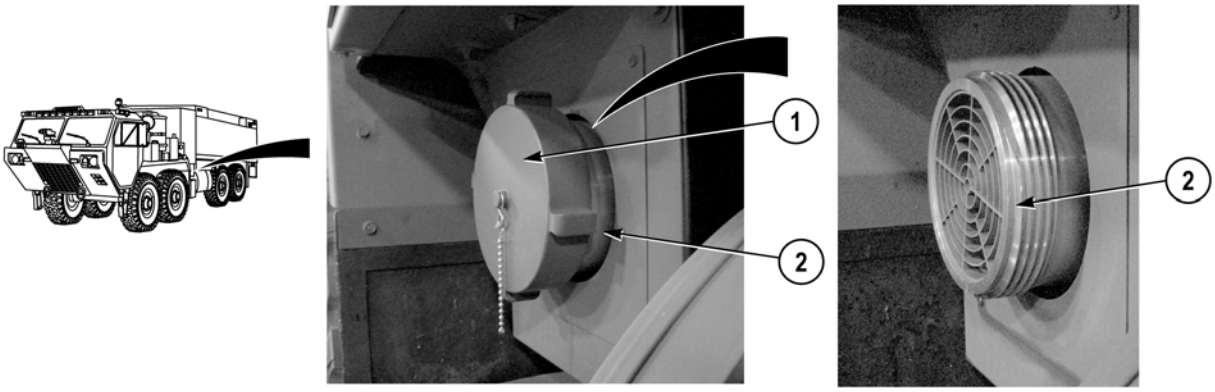
6. Put HIGH IDLE switch (7) to ON position. Indicator light (8) will illuminate.



NOTE

- Valve is completely open when green indicator light illuminates.
- Valve is completely closed when red indicator light illuminates.

7. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (9) until green indicator light (10) illuminates.
8. Flush water pump clean.
9. Push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (11) until red indicator light (12) illuminates.
10. Put HIGH IDLE switch (7) to OFF position. Indicator light (8) will go out.
11. Put PUMP PTO switch (5) to off position. Indicator light (6) will go out.
12. Close supply valve on positive water source.
13. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (9) until green indicator light (10) illuminates.
14. Push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (11) until red indicator light (12) illuminates.



15. Disconnect 5 in. (13 cm) soft discharge hose from driver side main inlet (2) and positive water source.
16. Install cap (1) on driver side main inlet (2).
17. If required, perform Post Operation Procedures (WP 0029).

END OF TASK

WATER TANK FLUSH

NOTE

When performing water tank flush, water tank must be filled using a positive water source (hydrant).

1. Fill water tank (WP 0014).
2. Drain water tank (WP 0014).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

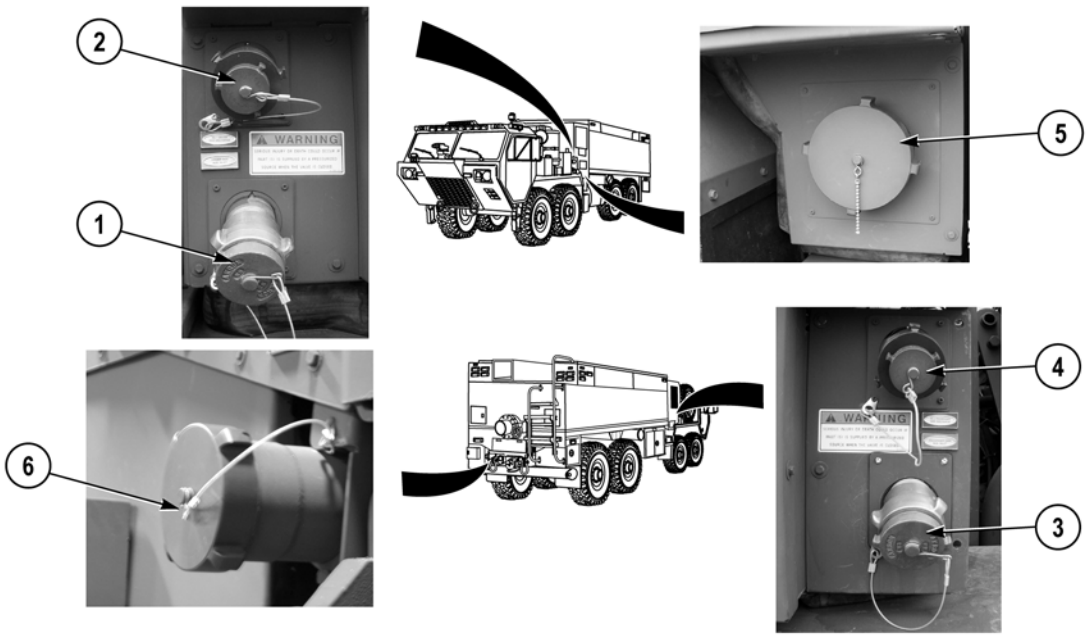
PREPARATION FOR STORAGE OR SHIPMENT

PREPARATION FOR STORAGE (LONG TERM: 6 MONTHS OR LONGER)

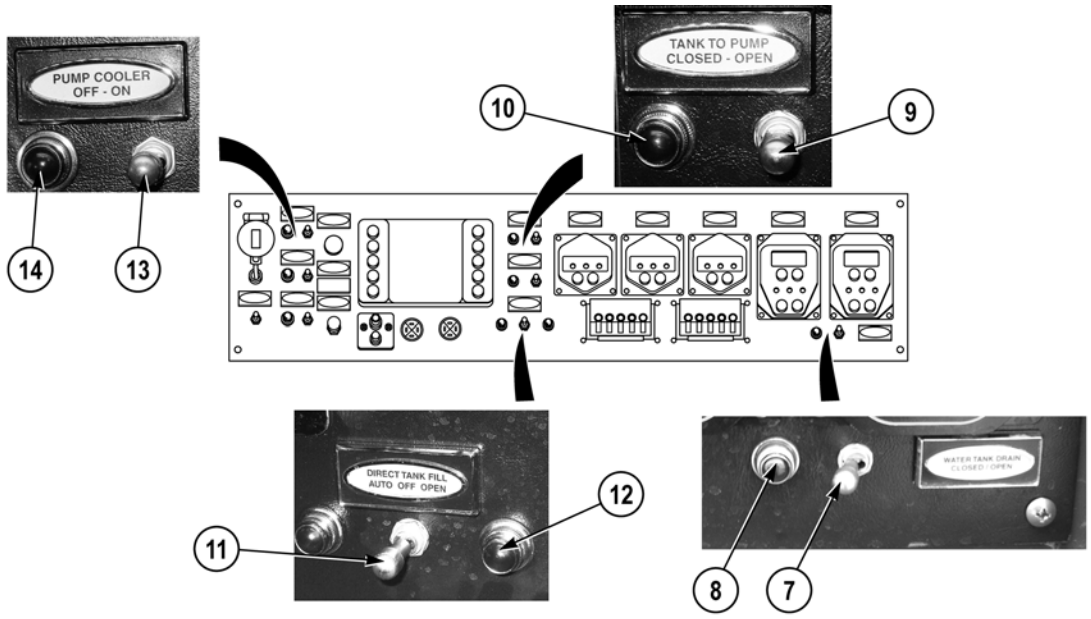
WARNING

Ensure vehicle is parked in a location where personnel and other equipment will be protected from water spraying out of discharges and drains during draining and blow-out procedures. Position vehicle so that it is level from side-to-side and either slightly nose down or level front-to-back. Failure to comply may cause damage to equipment and/or injury to personnel.

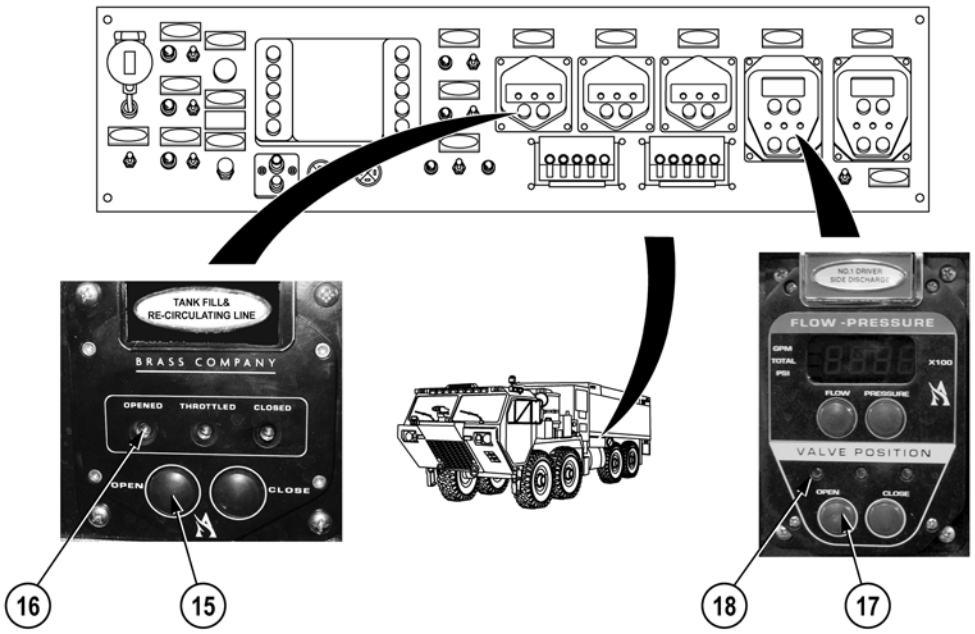
1. Position vehicle in a suitable location to drain and pump out remaining water.
2. Drain and flush foam tanks (WP 0021).
3. Flush water pump and tank (WP 0030).
4. Perform Preventive Maintenance Checks and Services (PMCS), Including Lubrication Instructions (WP 0126).



5. Remove DRIVER SIDE AUX. INLET cap (1), NO. 1 DRIVER SIDE DISCHARGE cap (2), PASSENGER SIDE AUX. INLET cap (3), NO. 2 PASSENGER SIDE DISCHARGE cap (4), main inlet cap (5), and DIRECT TANK FILL cap (6).



6. Put WATER TANK DRAIN switch (7) to OPEN position. Indicator light (8) will illuminate.
7. Put TANK TO PUMP switch (9) to OPEN position. Indicator light (10) will illuminate.
8. Put DIRECT TANK FILL switch (11) to OPEN position. Indicator light (12) will illuminate.
9. Put PUMP COOLER switch (13) to ON position. Indicator light (14) will illuminate.

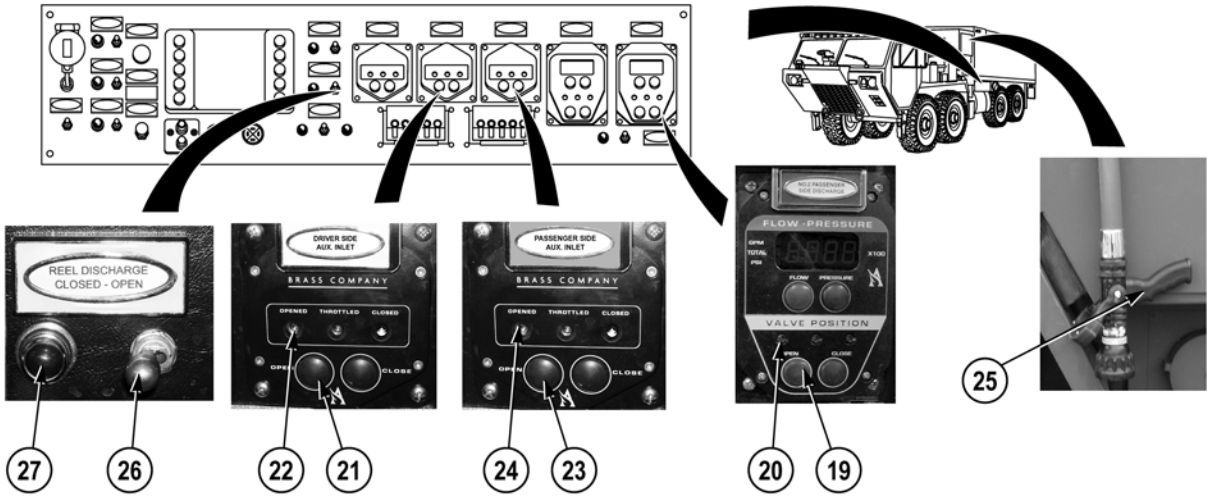


NOTE

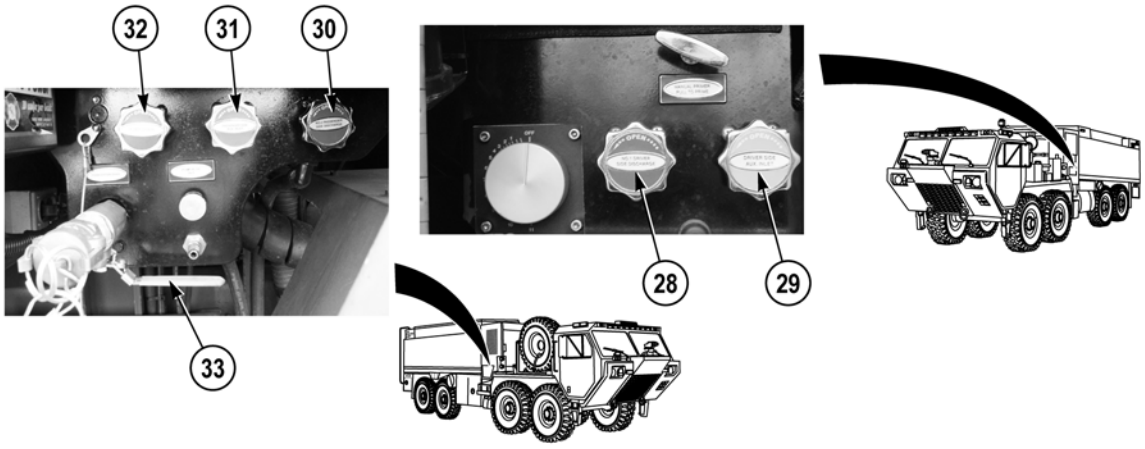
Valve is completely open when green indicator light illuminates.

10. Push TANK FILL & RE-CIRCULATING LINE valve control OPEN button (15) until green indicator light (16) illuminates.

11. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (17) until green indicator light (18) illuminates.

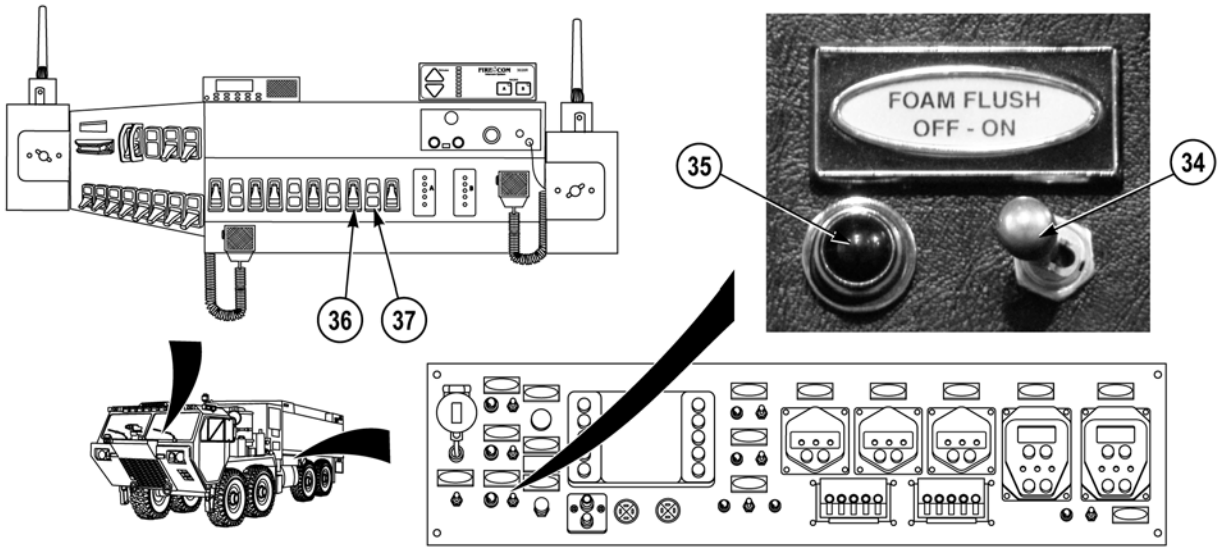


12. Push NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN button (19) until green indicator light (20) illuminates.
13. Push DRIVER SIDE AUX. INLET valve control OPEN button (21) until green indicator light (22) illuminates.
14. Push PASSENGER SIDE AUX. INLET valve control OPEN button (23) until green indicator light (24) illuminates.
15. Pull reel discharge hose away from vehicle and put reel discharge nozzle (25) to OPEN position.
16. Put REEL DISCHARGE switch (26) to OPEN position. Indicator light (27) will illuminates.



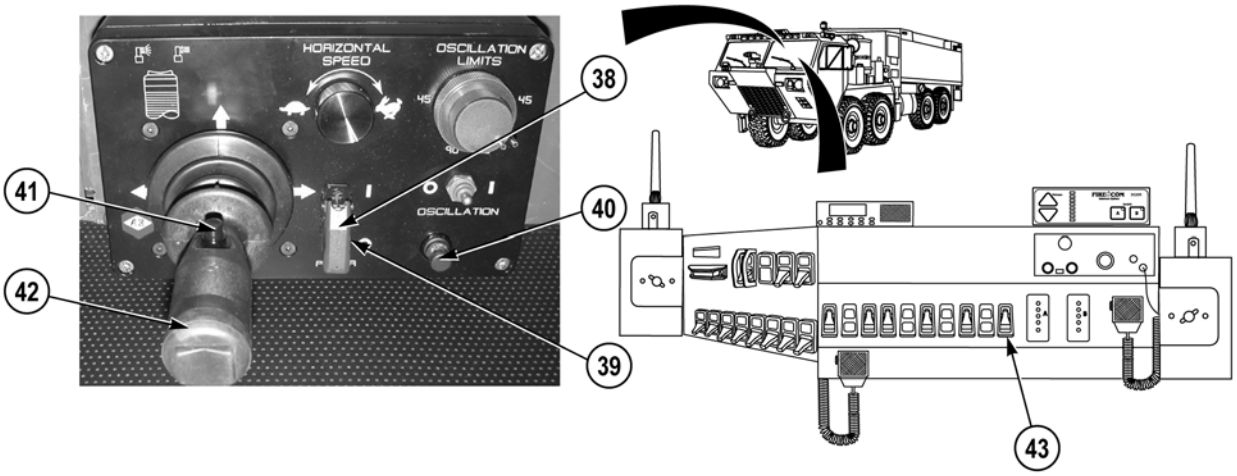
17. Open NO. 1 DRIVER SIDE DISCHARGE (28), DRIVER SIDE AUX. INLET (29), NO. 2 PASSENGER SIDE DISCHARGE (30), PASSENGER SIDE AUX. INLET (31), and PUMP DRAIN (32) valves.

18. Remove cap and turn foam TANK DRAIN VALVE handle (33) to OPEN position.



19. Put FOAM FLUSH switch (34) to ON position. Indicator light (35) will illuminate.

20. Put UNDER TRUCK NOZZLES switch (36) to on position. Indicator light (37) will illuminate.



WARNING

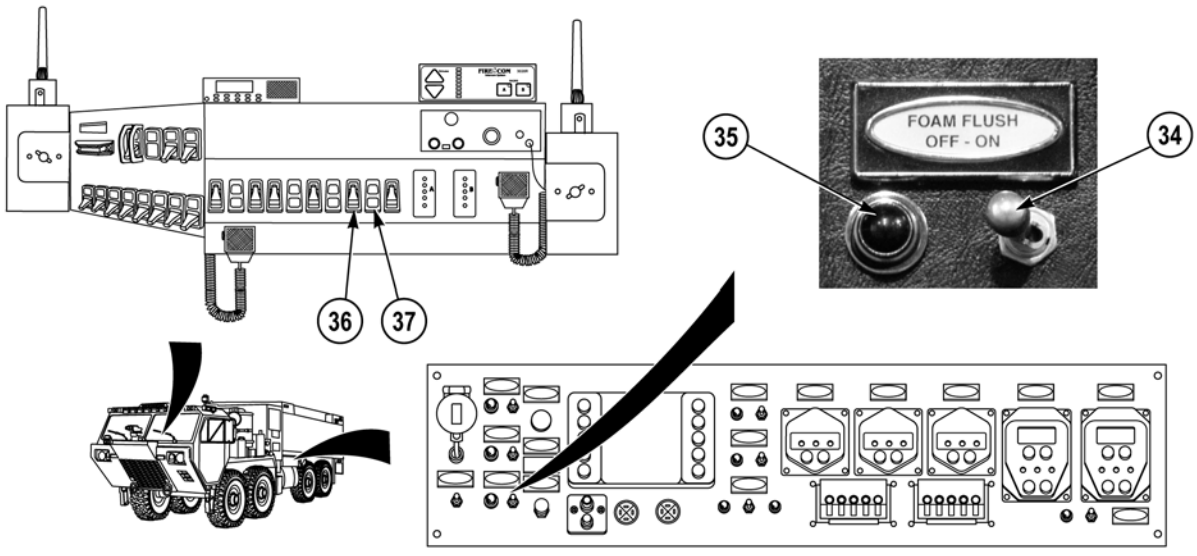
Turrets should never be pointed at personnel. Failure to comply may result in injury or death to personnel.

21. Lift bumper turret power switch guard (38), and put POWER switch (39) to **|** (on) position. Indicator light (40) will illuminate.
22. Push and release agent discharge button (41) on front of joystick control handle (42) to begin discharge.
23. Put WINDSHIELD DELUGE switch (43) to on position, and discharge water for 15 to 30 seconds after tank is empty.
24. Pull battery disconnect switch to off position (WP 0007).

NOTE

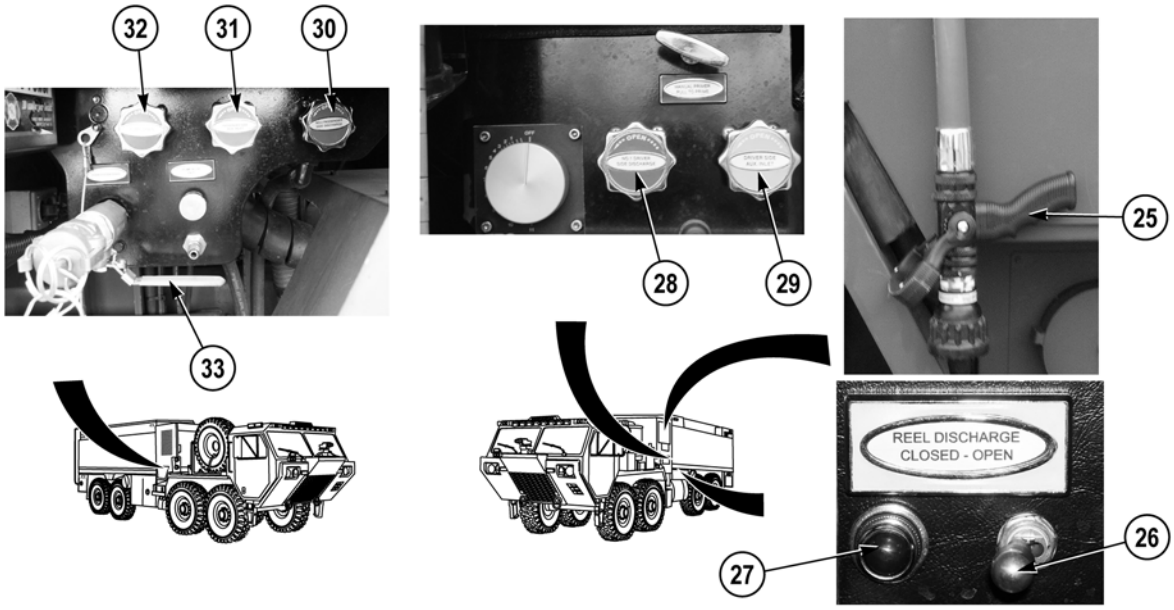
All valves should be left open for 24 hours, to allow water to evaporate from system.

25. Push battery disconnect switch to on position (WP 0007).
26. Push and release agent discharge button (41) on front of joystick control handle (42) to stop discharge.
27. Put POWER switch (39) to ○ (off) position. Indicator light (40) will go out.



28. Put UNDER TRUCK NOZZLES switch (36) to off position. Indicator light (37) will go out.

29. Put FOAM FLUSH switch (34) to OFF position. Indicator light (35) will go out.

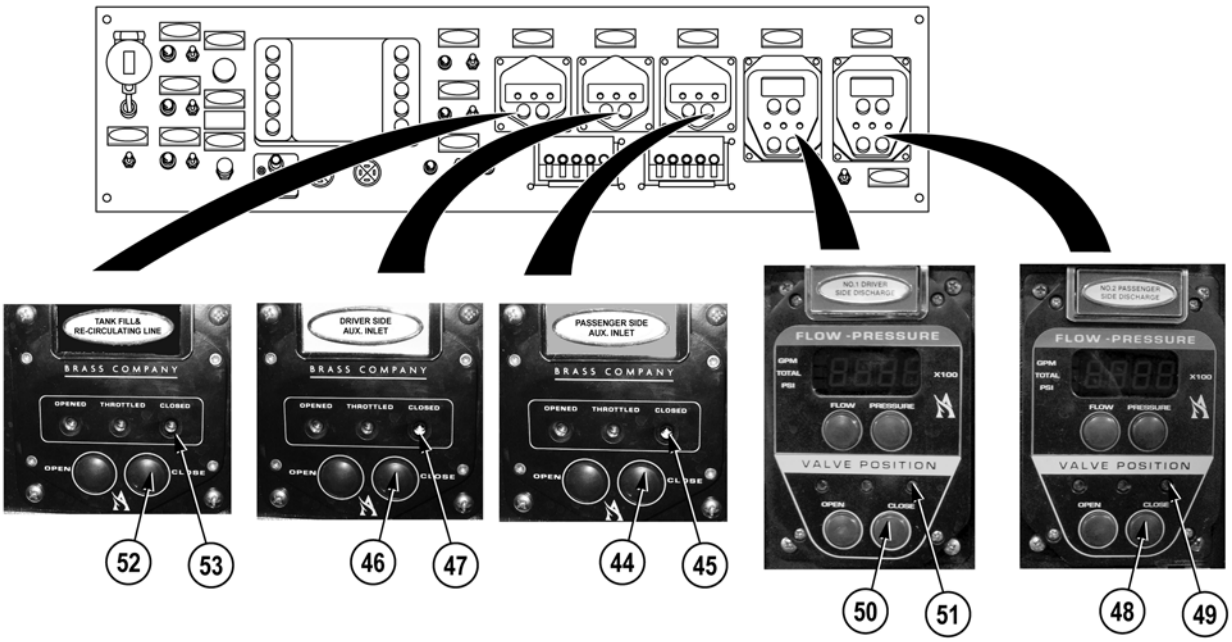


30. Turn FOAM TANK DRAIN valve handle (33) to CLOSED position and install cap.

31. Close NO. 1 DRIVER SIDE DISCHARGE (28), DRIVER SIDE AUX. INLET (29), NO.2 PASSENGER SIDE DISCHARGE (30), PASSENGER SIDE AUX. INLET (31), and PUMP DRAIN (32) valves.

32. Put reel discharge nozzle (25) to closed position and stow hose on hose reel (WP 0024).

33. Put REEL DISCHARGE switch (26) to CLOSED position. Indicator light (27) will go out.



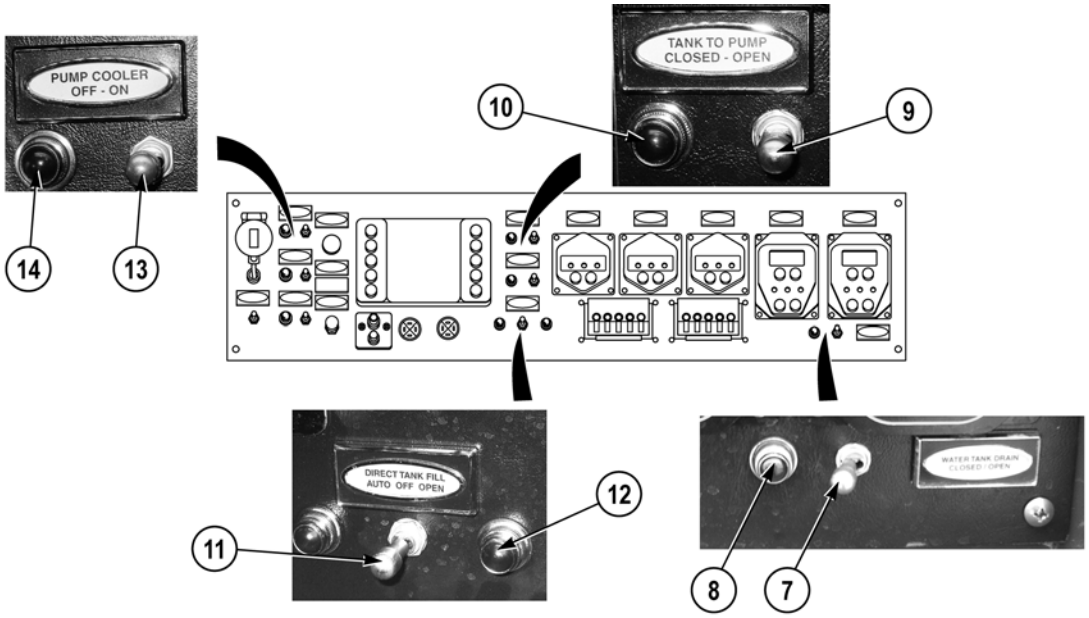
34. Push PASSENGER SIDE AUX. INLET valve control CLOSE button (44) until red indicator light (45) illuminates.

35. Push DRIVER SIDE AUX. INLET valve control CLOSE button (46) until red indicator light (47) illuminates.

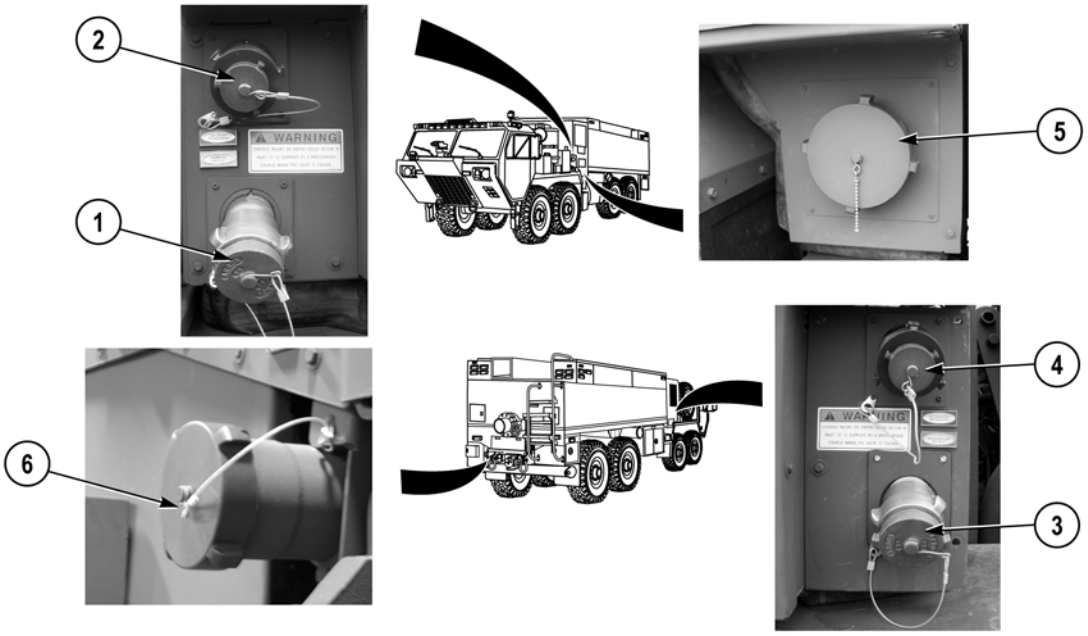
36. Push NO. 2 PASSENGER SIDE DISCHARGE valve control CLOSE button (48) until red indicator light (49) illuminates.

37. Push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (50) until red indicator light (51) illuminates.

38. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (52) until red indicator light (53) illuminates.



39. Put PUMP COOLER switch (13) to OFF position. Indicator light (14) will go out.
40. Put DIRECT TANK FILL switch (11) to CLOSED position. Indicator light (12) will go out.
41. Put TANK TO PUMP switch (9) to CLOSED position. Indicator light (10) will go out.
42. Put WATER TANK DRAIN switch (7) to CLOSED position. Indicator light (8) will go out.



43. Install DRIVER SIDE AUX. INLET cap (1), NO. 1 DRIVER SIDE DISCHARGE cap (2), PASSENGER SIDE AUX. INLET cap (3), NO. 2 PASSENGER SIDE DISCHARGE cap (4), main inlet cap (5), and DIRECT TANK FILL cap (6).
44. Perform Pump and Plumbing Blowout procedures if required (WP 0032).
45. Report all deficiencies to Supervisor.
46. Drain all air tanks (TM 9-2320-279-10).

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PUMP AND PLUMBING BLOWOUT PROCEDURES

WARNING

This procedure requires two personnel to complete. Failure to comply may result in injury to personnel.

CAUTION

Vehicle temperature needs to be at 50°F (10°C) before performing pump and blowout procedures. Failure to comply may result in damage to equipment.

NOTE

This procedure is to be used when preparing the HEWATT for storage and shipment for post operation in cold environment.

1. Complete mission.

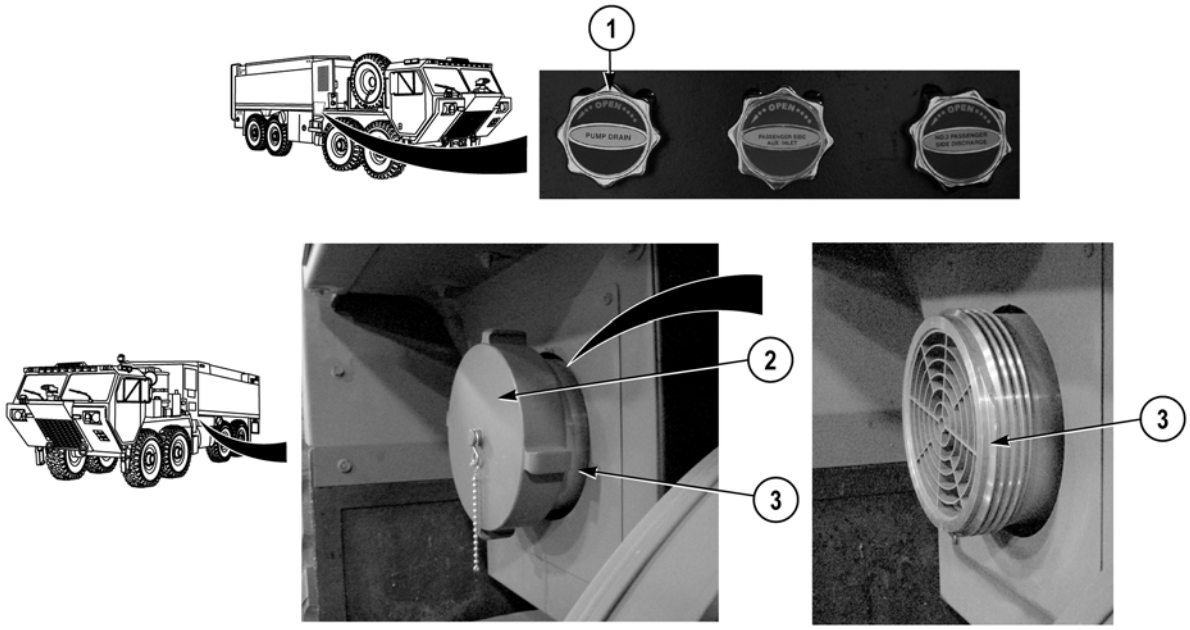
WARNING

Ensure vehicle is parked in a location where personnel and other equipment will be protected from water spraying out of discharges and drains during draining and blowout procedures. Position vehicle so that vehicle is level from side to side and slightly nose down front to back. Failure to comply may cause damage to equipment and/or injury to personnel.

CAUTION

- **If you are unable to follow this procedure due to inability to build up proper air pressure, do not leave vehicle in an environment that will expose it to temperatures of 32°F (0°C) or less. Failure to comply may result in damage to equipment.**
- **Damage to water pump may result if Post Operation Procedures (WP 0029) are not completed before performing Pump and Blowout Procedures.**

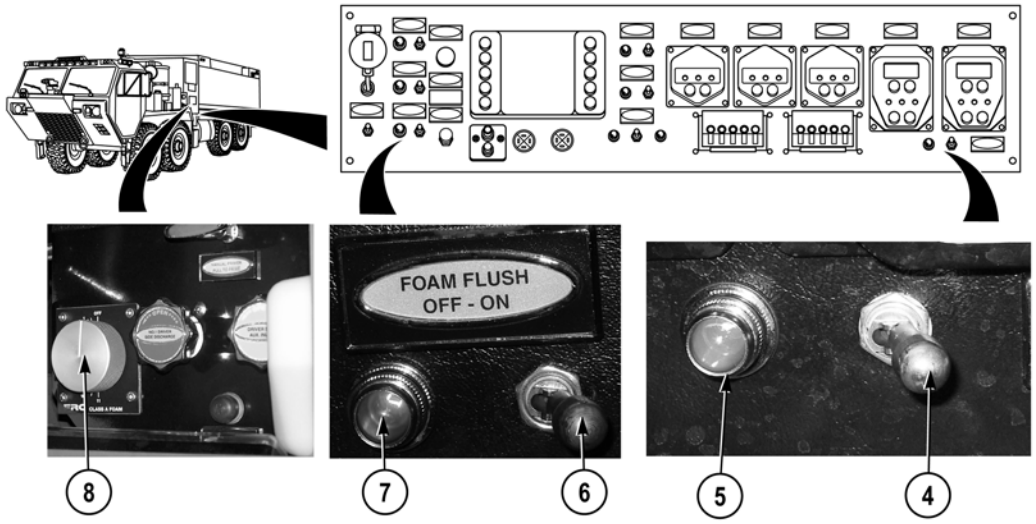
2. Position vehicle on a level surface in a suitable location to drain and spray out remaining water.
3. Apply parking brake (TM 9-2320-279-10).
4. Drain water tank (WP 0014).



NOTE

Leave all three water tank manual bray dump valves in open position, during entire procedure.

5. Open PUMP DRAIN valve (1).
6. After water has finished draining, close PUMP DRAIN valve (1).
7. Remove cap (2) from main inlet (3).
8. When water is done draining, install cap (2) on driver side main inlet (3).



NOTE

Perform Step (9) only if foam system and foam agent tank is going to be left in a “dry condition”.

9. Drain and flush foam agent from foam tank (WP 0021).

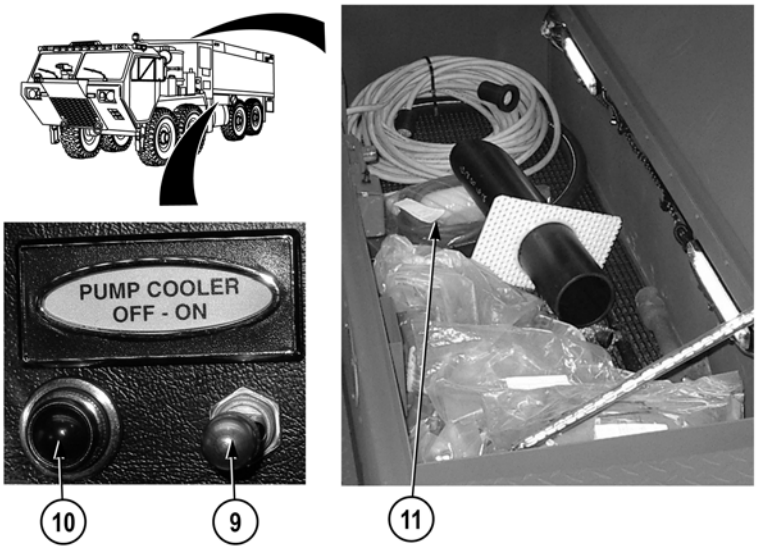
NOTE

Ensure all inlet and discharge valve controls are in closed position before proceeding.

10. Put WATER TANK DRAIN switch (4) to OPEN position. Indicator light (5) will illuminate. Keep WATER TANK DRAIN valve in open position during entire procedure.

11. Put FOAM FLUSH switch (6) to ON position. Indicator light (7) will illuminate.

12. Open manual FOAM METERING valve (8) to fully open position.

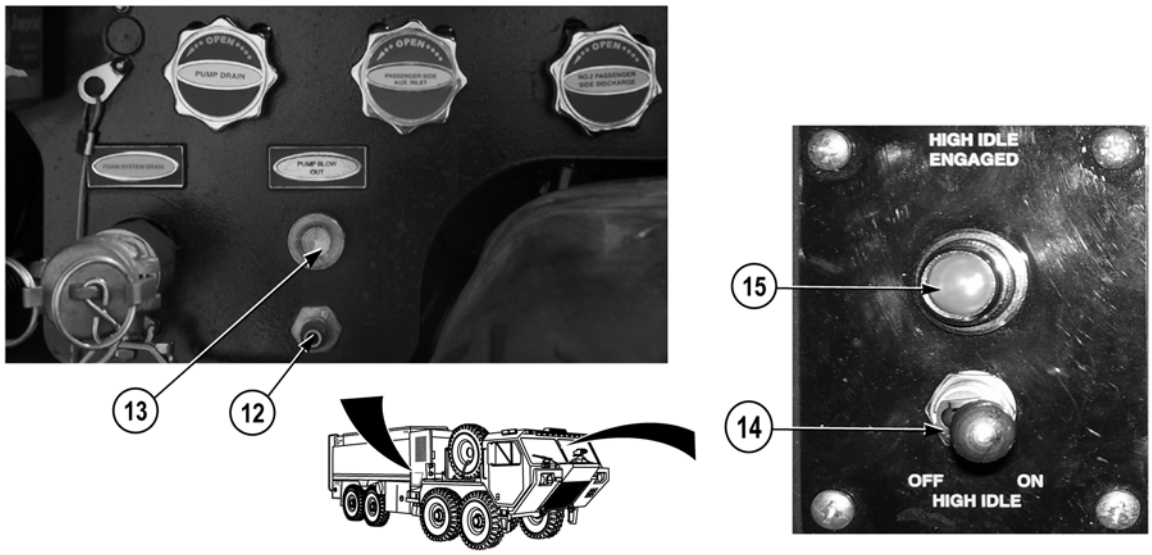


NOTE

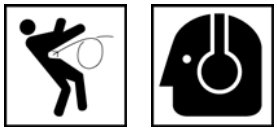
Keep FOAM FLUSH switch and manual FOAM METERING valve in ON/OPEN position during entire blowout procedure.

13. Put PUMP COOLER switch (9) to ON position. Indicator light (10) will illuminate.

14. Remove air hose (11) from stowage compartment T2.



WARNING

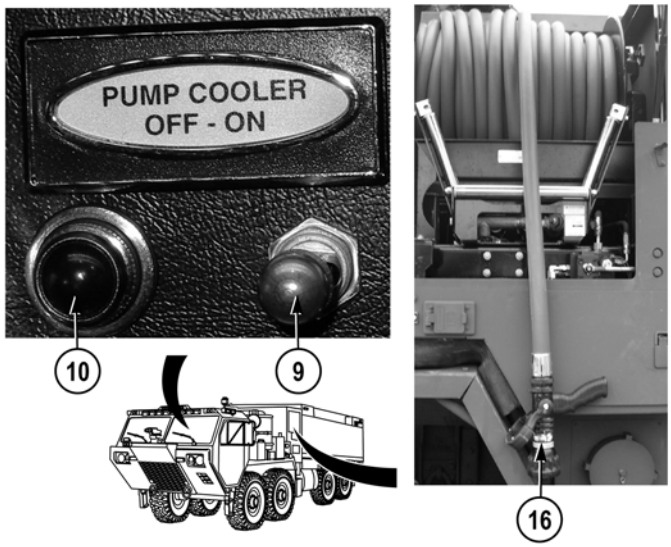


- **Be careful when using high air pressure. Ensure connections and seals are tight before applying pressure. High air pressure can blow out parts, hoses, or debris with force. Explosive force can cause damage to equipment or injury to personnel.**
- **Wear single hearing protection (earplugs or equivalent) while working around compressed air. Failure to comply may result in damage to your hearing. Seek medical assistance should a hearing problem be suspected.**

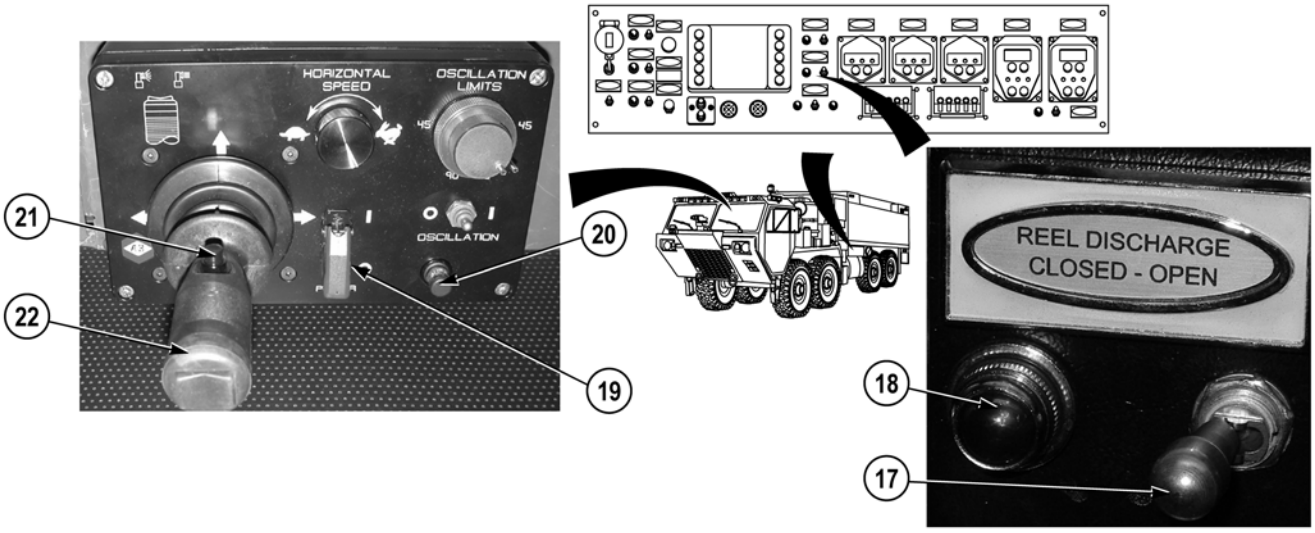
NOTE

- Use shop air whenever possible for pump and plumbing blowout procedures. Air pressure will be more constant with shop air than vehicle air.
- If using vehicle air supply ensure vehicle is in neutral, wheels are chocked, and parking brakes are applied.
- Ensure all valve controls are in closed position before connecting air hoses.

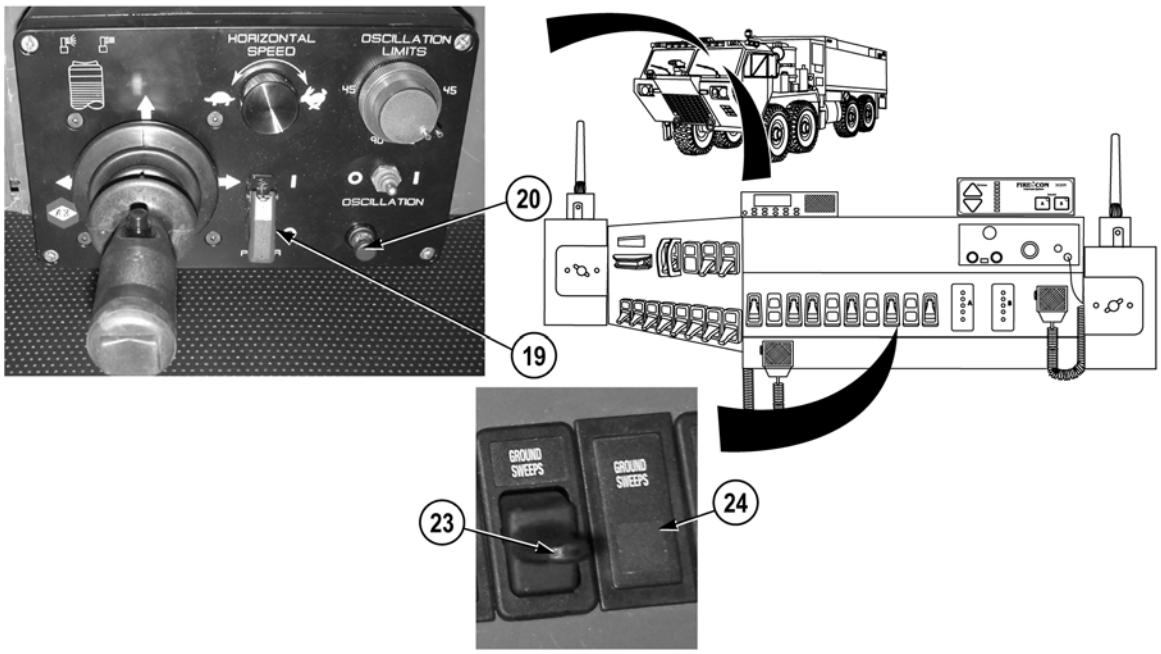
15. Connect air hose (11) to PUMP BLOW OUT adapter (12) and air supply.
16. Open PUMP BLOW OUT air supply valve (13).
17. If using vehicle for air supply, start vehicle (TM 9-2320-279-10).
18. Put HIGH IDLE switch (14) to ON position. Indicator light (15) will illuminate.



19. Put PUMP COOLER switch (9) to OFF position. Indicator light (10) will go out.
20. Open pump house access door assembly (WP 0009).
21. Pull hose nozzle (16) out away from vehicle to a suitable draining location (WP 0024).
22. Open hose nozzle (16).



23. Let pressure build above 50 psi (345 kPa) then, put REEL DISCHARGE switch (17) to OPEN position. Indicator light (18) will illuminate.
24. Let pressure drop to 0 psi (0 kPa). Put REEL DISCHARGE switch (17) to CLOSED position. Indicator light (18) will go out.
25. Repeat Steps (23) and (24).
26. Close hose nozzle (16).
27. Put PUMP COOLER switch (9) to ON position. Indicator light (10) will illuminate.
28. Stow hose on hose reel (WP 0024).
29. Put PUMP COOLER switch (9) to OFF position. Indicator light (10) will go out.
30. Put bumper turret POWER switch (19) to **|** (on) position. Indicator light (20) will illuminate.
31. Let pressure build above 50 psi (345 kPa), then press and release bumper turret agent discharge button (21) on joystick control handle (22) to turn on and blowout bumper turret and plumbing. Let pressure drop to 0 psi (0 kPa). Press and release bumper turret agent discharge button (21) on joystick control handle (22) to turn off bumper turret.
32. Repeat Step (31).

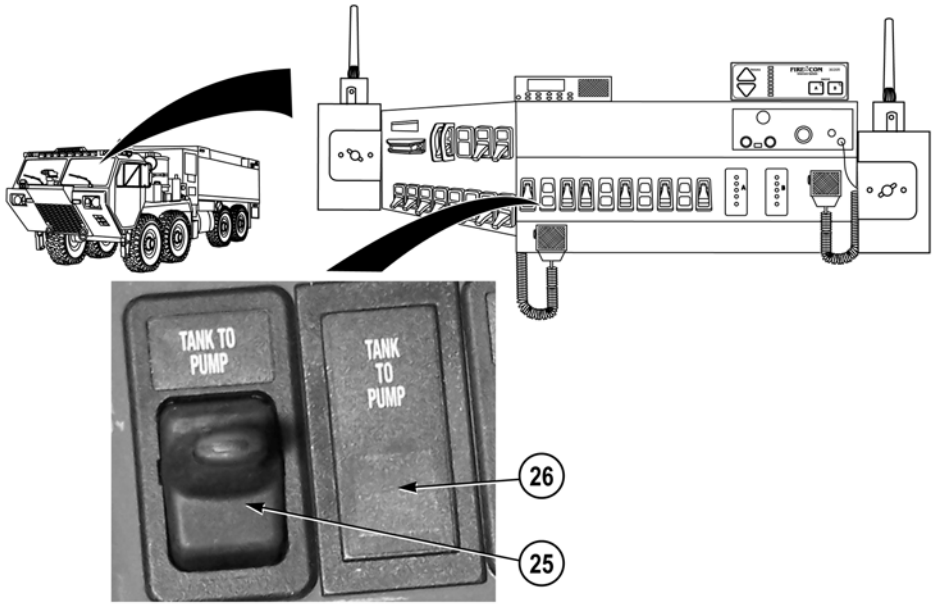


33. Put bumper turret power switch (19) to ○ (off) position. Indicator light (20) will go out.

34. Let pressure build above 50 psi (345 kPa). Put UNDER TRUCK NOZZLES switch (23) to ON position. Indicator light (24) will illuminate.

35. Let pressure drop to 0 psi (0 kPa). Put UNDER TRUCK NOZZLES switch (23) to OFF position. Indicator light (24) will go out.

36. Repeat Steps (34) and (35).



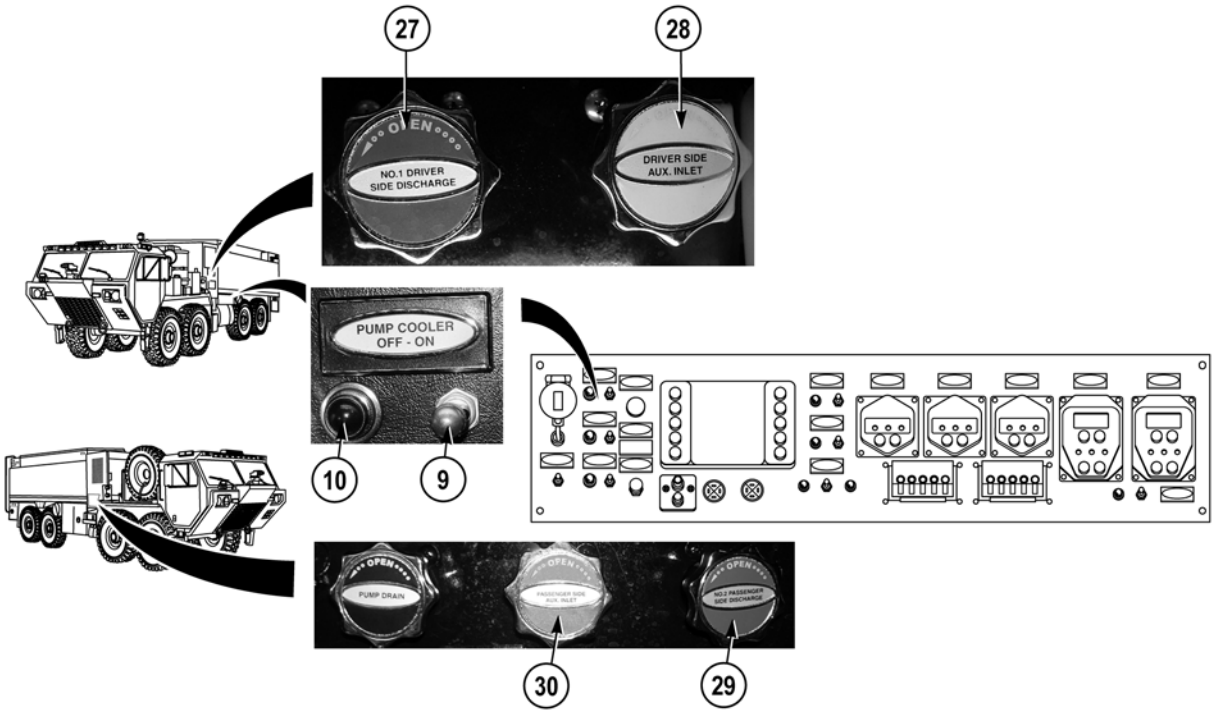
37. Let pressure build above 50 psi (345 kPa). Put TANK TO PUMP switch (25) to open position. Indicator light (26) will illuminate.

NOTE

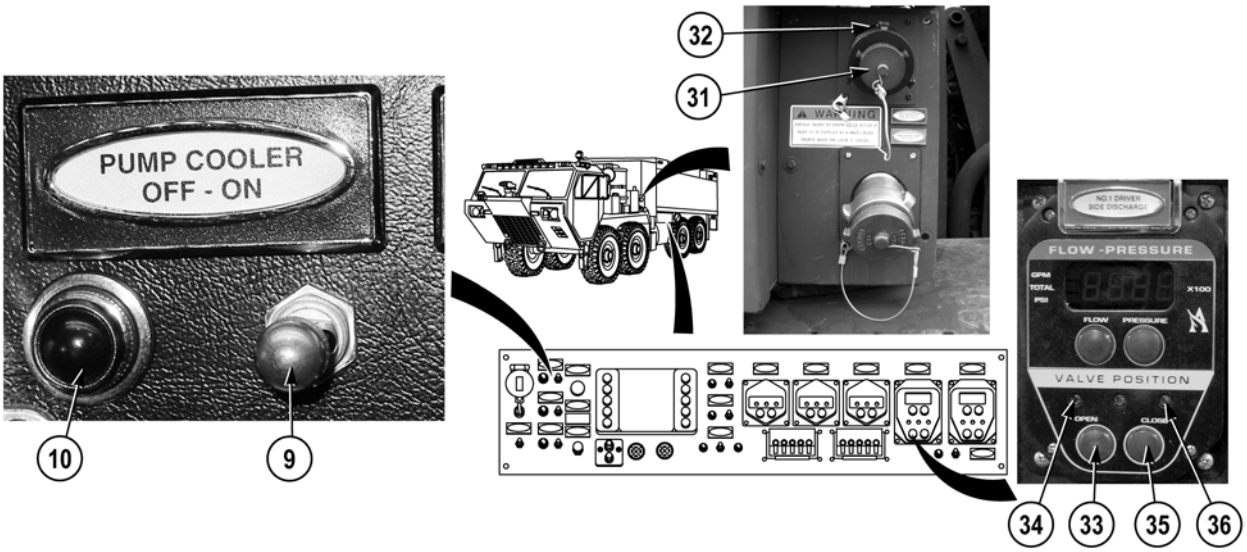
It will take longer than other discharges for tank-to-pump piping to drain. Ensure pressure has dropped to zero or has been energized for at least 30 seconds before proceeding to next step.

38. Put TANK TO PUMP switch (25) to CLOSED position. Indicator light (26) will go out.

39. Repeat Steps (37) and (38).



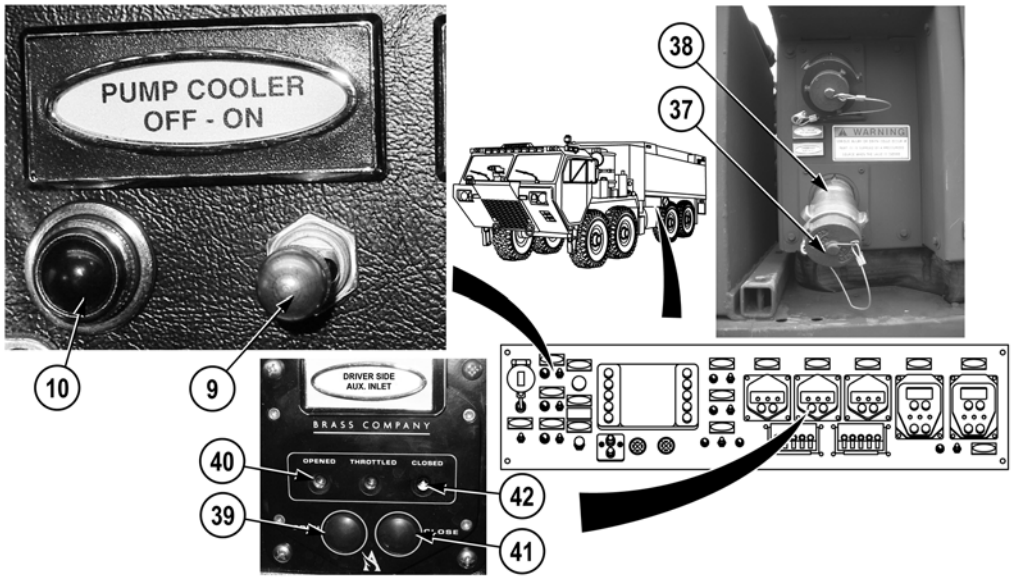
40. Put PUMP COOLER switch (9) to OPEN position. Indicator light (10) will illuminate.
41. Open NO. 1 DRIVER SIDE DISCHARGE (27) and DRIVER SIDE AUX. INLET drain valves (28).
42. Open NO. 2 PASSENGER SIDE DISCHARGE (29) and PASSENGER SIDE AUX. INLET drain valves (30).



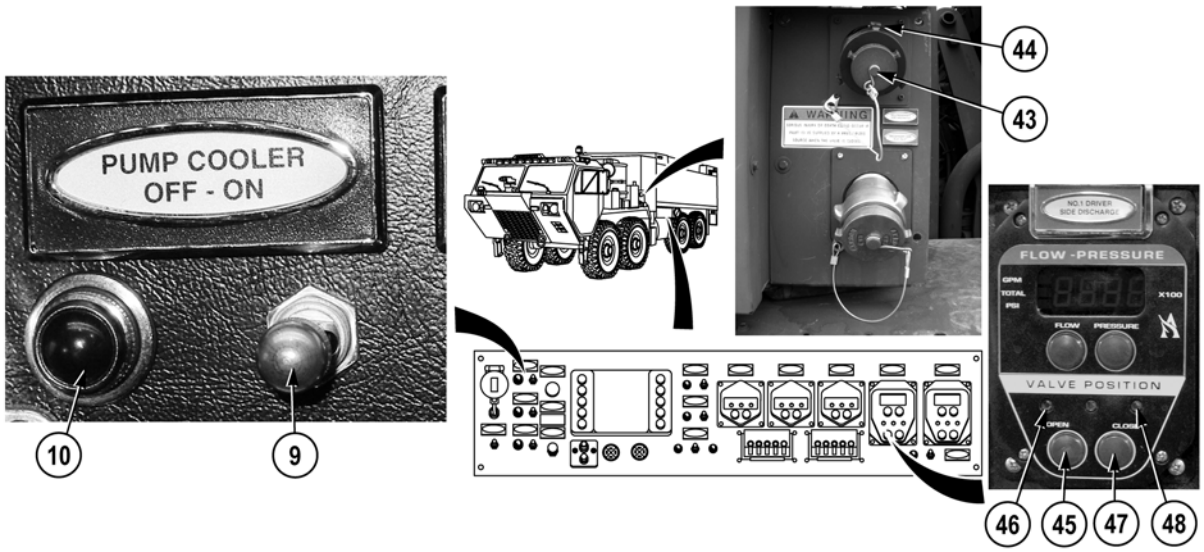
NOTE

- Valve is completely open when green indicator light illuminates.
- Valve is completely closed when red indicator light illuminates.
- Do not open PUMP DRAIN valve.

43. Remove cap (31) from NO. 1 DRIVER SIDE DISCHARGE (32).
44. Put PUMP COOLER switch (9) to CLOSED position. Indicator light (10) will go out.
45. Let pressure build above 50 psi (345 kPa). Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (33) until green indicator light (34) illuminates.
46. Let pressure drop to 0 psi (0 kPa). Push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (35) until red indicator light (36) illuminates.
47. Repeat Steps (45) and (46).



48. Put PUMP COOLER switch (9) to ON position. Indicator light (10) will illuminate.
49. Remove cap (37) from DRIVER SIDE AUX. INLET (38).
50. Put PUMP COOLER switch (9) to OFF position. Indicator light (10) will go out.
51. Let pressure build above 50 psi (345 kPa). Push DRIVER SIDE AUX. INLET valve control OPEN button (39) until green indicator light (40) illuminates.
52. Let pressure drop to 0 psi (0 kPa). Push DRIVER SIDE AUX. INLET valve control CLOSE button (41) until red indicator light (42) illuminates.
53. Repeat Steps (51) and (52).



54. Put PUMP COOLER switch (9) to ON position. Indicator light (10) will illuminate.

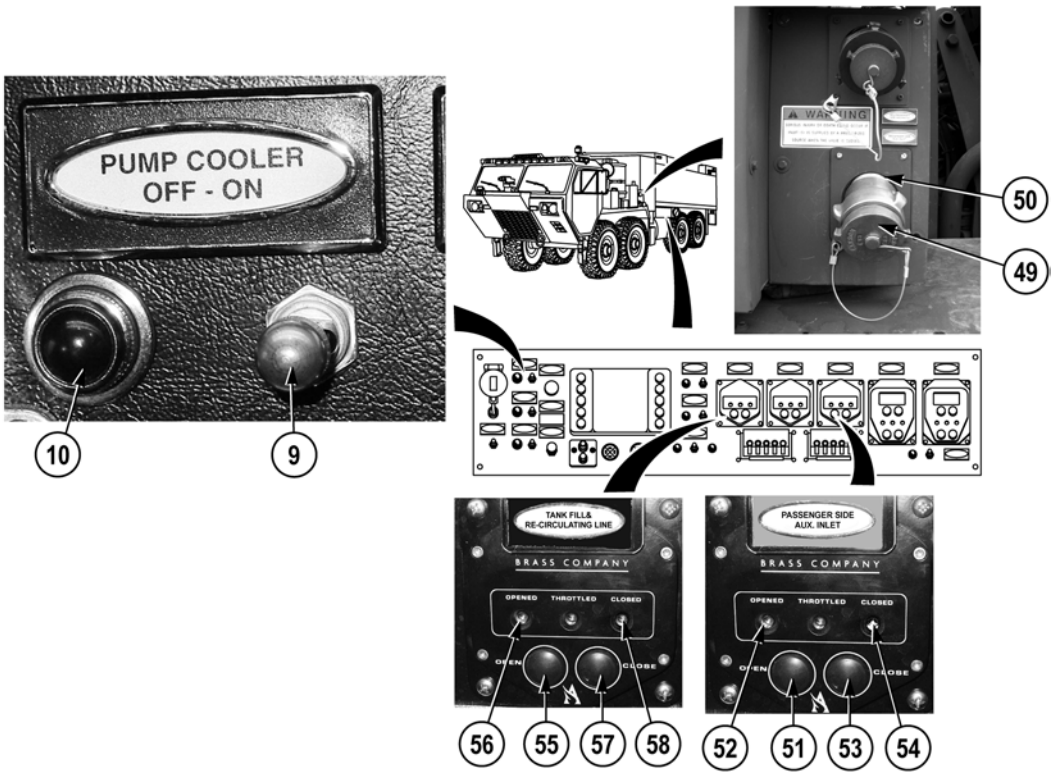
55. Remove cap (43) from NO. 2 PASSENGER SIDE DISCHARGE (44).

56. Put PUMP COOLER switch (9) to OFF position. Indicator light (10) will go out.

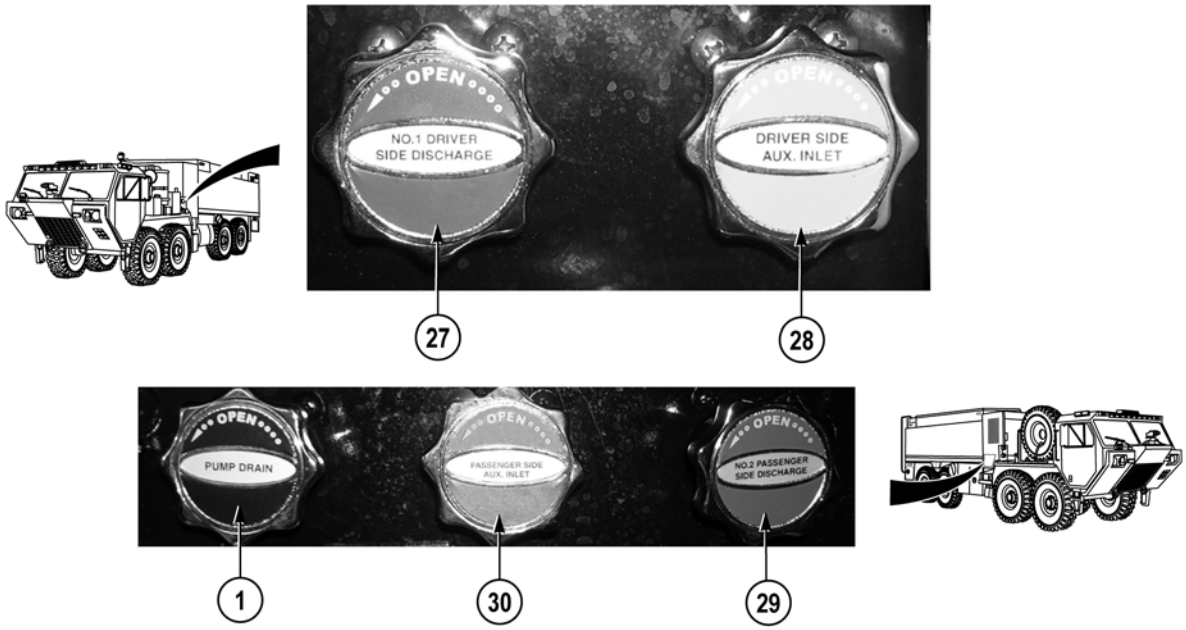
57. Let pressure build above 50 psi (345 kPa). Push NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN button (45) until green indicator light (46) illuminates.

58. Let pressure drop to 0 psi (0 kPa). Push NO. 2 PASSENGER SIDE DISCHARGE valve control CLOSE button (47) until red indicator light (48) illuminates.

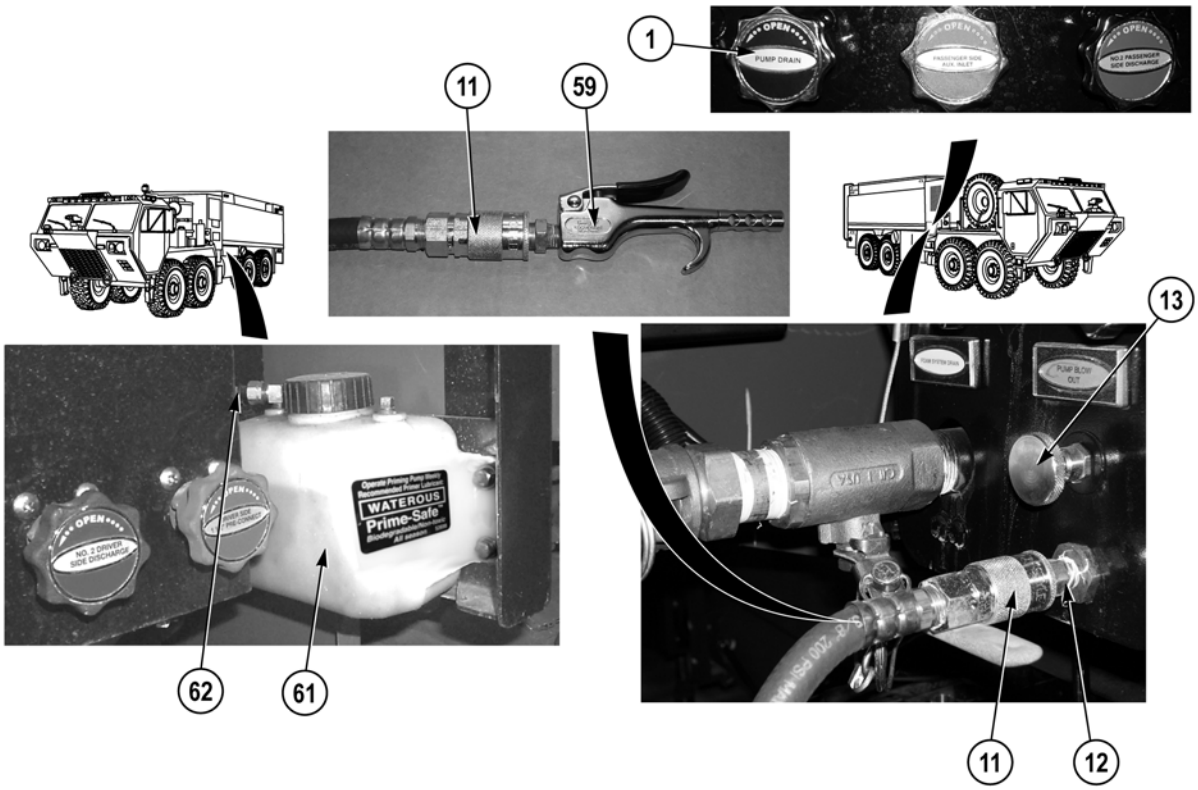
59. Repeat Steps (57) and (58).



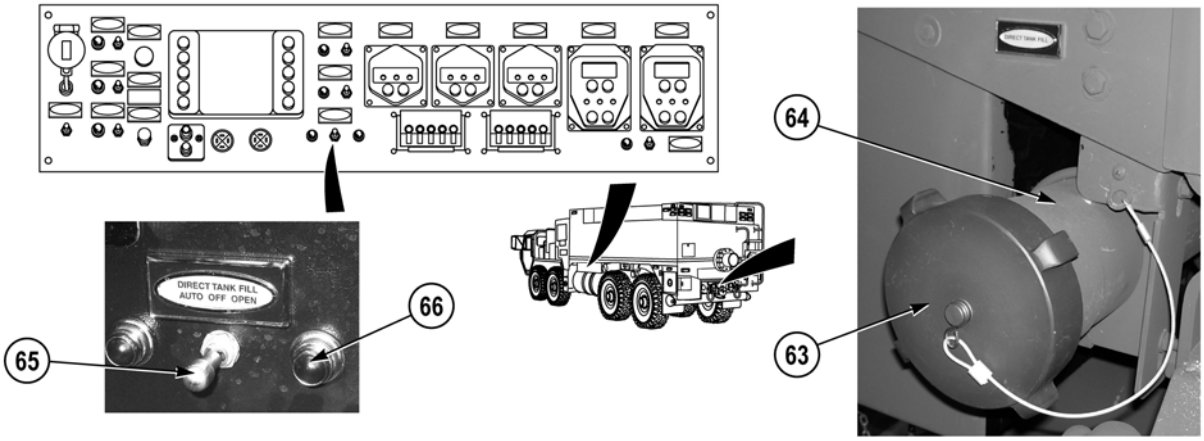
60. Put PUMP COOLER switch (9) to ON position. Indicator light (10) will illuminate.
61. Remove cap (49) from PASSENGER SIDE AUX. INLET (50).
62. Put PUMP COOLER switch (9) to OFF position. Indicator light (10) will go out.
63. Let pressure build above 50 psi (345 kPa). Push PASSENGER SIDE AUX. INLET valve control OPEN button (51) until green indicator light (52) illuminates.
64. Let pressure drop to 0 psi (0 kPa). Push PASSENGER SIDE AUX. INLET valve control CLOSE button (53) until red indicator light (54) illuminates.
65. Repeat Steps (63) and (64).
66. Let pressure build above 50 psi (345 kPa). Push TANK FILL & RE-CIRCULATION LINE valve control OPEN button (55) until green indicator light (56) illuminates.
67. Let pressure drop to 0 psi (0 kPa). Push TANK FILL & RE-CIRCULATION LINE valve control CLOSE button (57) until red indicator light (58) illuminates.
68. Repeat Steps (66) and (67).



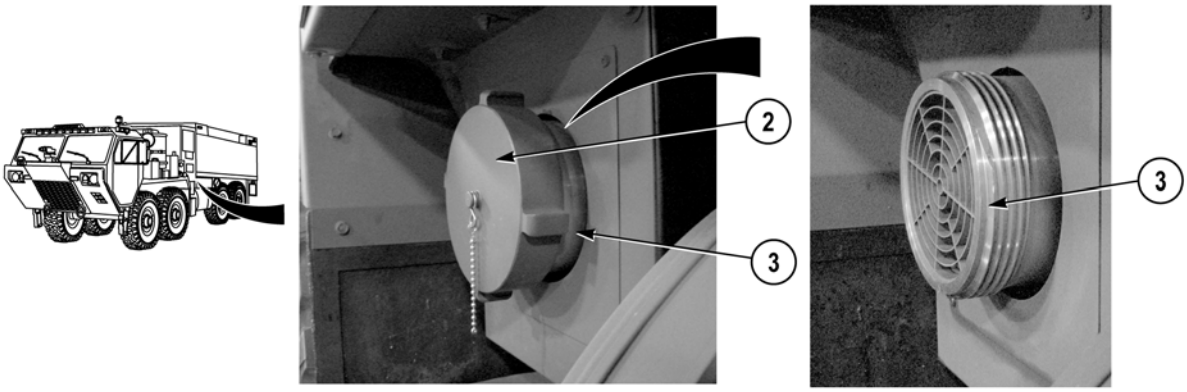
69. Close NO. 1 DRIVER SIDE DISCHARGE (27) and DRIVER SIDE AUX. INLET drain valves (28).
70. Close NO. 2 PASSENGER SIDE DISCHARGE (29) and PASSENGER SIDE AUX. INLET drain valves (30).
71. Let pressure build above 50 psi (345 kPa) on pump discharge gauge, then open water PUMP DRAIN valve (1).



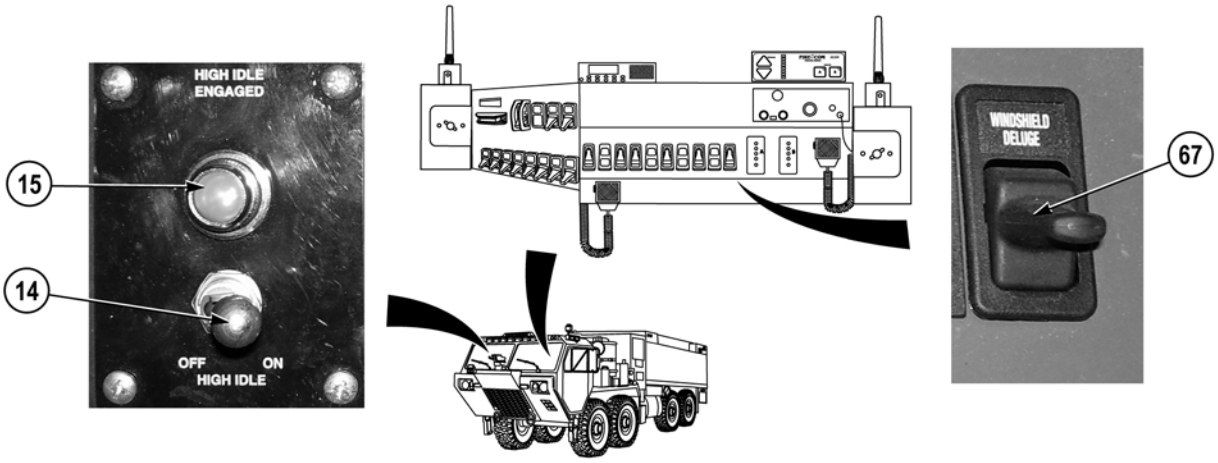
72. When water stops running from water PUMP DRAIN valve (1), close PUMP BLOW OUT air supply valve (13).
73. Disconnect air hose (11) from PUMP BLOW OUT adapter (12).
74. Remove nozzle (59) from stowage compartment (WP 0039).
75. Attach nozzle (59) to air hose (11).
76. Remove primer tank (61) (WP 0164) and drain primer tank (61).
77. Blow air through primer tank hose (62).
78. Reinstall primer tank (61) (WP 0164).
79. Disconnect air hose (11) from air supply.
80. Close water PUMP DRAIN valve (1).
81. Stow air hose (11) and nozzle (59) in stowage compartment (WP 0039).



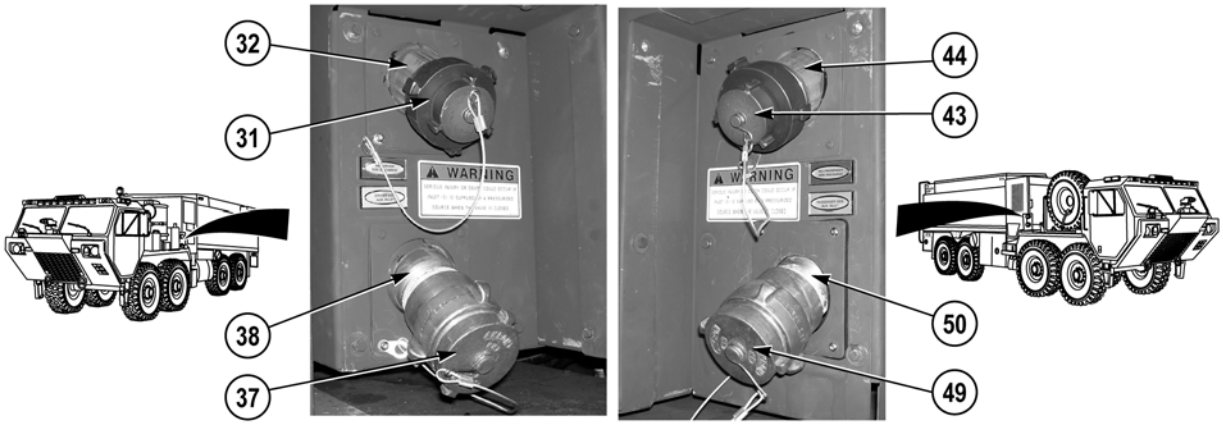
82. Remove cap (63) from DIRECT TANK FILL inlet port (64).
83. Put DIRECT TANK FILL switch (65) to OPEN position. Indicator light (66) will illuminate.
84. Allow tank and plumbing to drain completely.
85. Put DIRECT TANK FILL switch (65) to OFF position. Indicator light (66) will go out.
86. Install cap (63) on DIRECT TANK FILL inlet port (64).



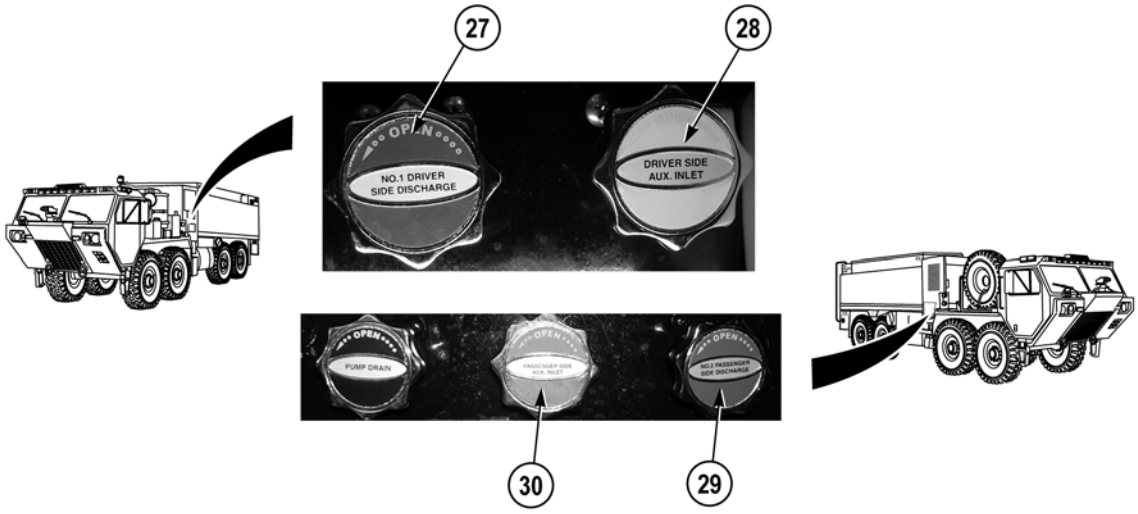
87. Remove cap (2) from driver side main inlet (3).
88. Allow water to drain from driver side main inlet (3).
89. Install cap (2) on driver side main inlet (3).
90. Turn on vehicle windshield wipers (TM 9-2320-279-10).



91. Put WINDSHIELD DELUGE switch (67) to on position.
92. When water stops being discharged from two windshield deluge nozzles, put WINDSHIELD DELUGE switch (67) to off position.
93. Turn OFF vehicle windshield wipers (TM 9-2320-279-10).
94. Put HIGH IDLE switch (14) to OFF position. Indicator light (15) will go out.



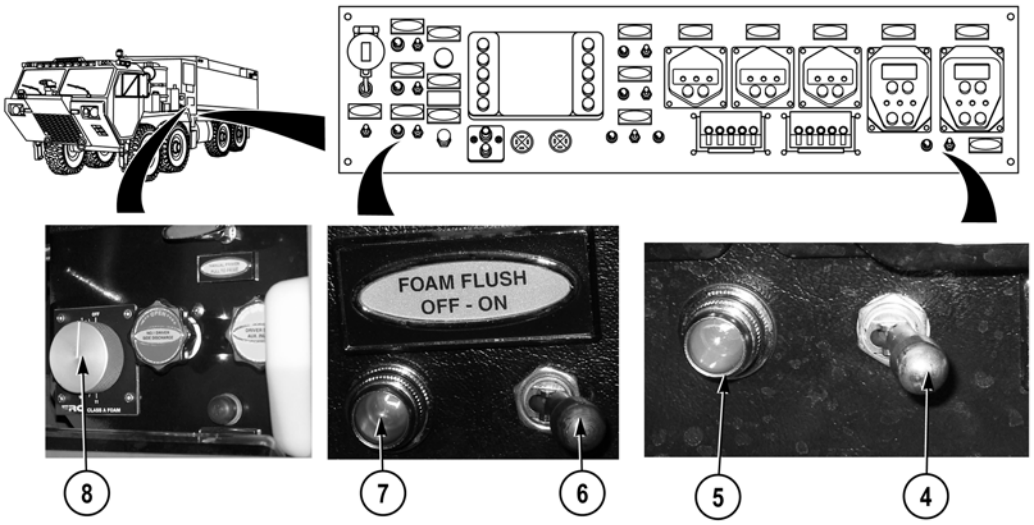
95. Install cap (31) on NO. 1 DRIVER SIDE DISCHARGE (32).
96. Install cap (37) on DRIVERS SIDE AUX. INLET (38).
97. Install cap (43) on NO. 2 PASSENGER SIDE DISCHARGE (44).
98. Install cap (49) on PASSENGER SIDE AUX. INLET (50).



⚠ CAUTION

Do not open any foam agent supply valves. This will contaminate water tank.

99. Close NO. 1 DRIVER SIDE DISCHARGE (27), DRIVER SIDE AUX. INLET drain valves (28), NO. 2 PASSENGER SIDE DISCHARGE (29), and PASSENGER SIDE AUX. INLET drain valves (30).



100. Position vehicle where it is to be stored.

101. Put WATER TANK DRAIN switch (4) to CLOSE position. Indicator light (5) will go out.

102. Close driver side, passenger side, and rear manual tank drain dump valves (WP 0014).

103. Put FOAM FLUSH switch (6) to OFF position. Indicator light (7) will go out.

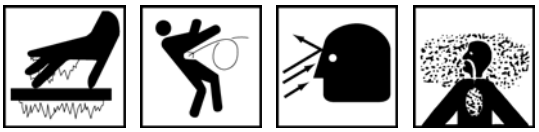
104. Close manual FOAM METERING valve (8).

END OF WORK PACKAGE

OPERATOR MAINTENANCE

OPERATION IN COLD ENVIRONMENT, -25°F TO 32°F (-32°C TO 0°C)

WARNING



- **Do not touch extremely cold metal below -26°F (-32°C). Bare skin may freeze to cold metal and cause injury to personnel.**
- **All valves should be opened and closed slowly during any procedure. Sudden changes in pressure may cause equipment to react faster than personnel can be alerted. Ensure surrounding personnel are aware of changes being made to settings on equipment. Failure to comply may result in injury or death to personnel and damage to equipment.**
- **Diesel fuel compartment heater comes on automatically when truck engine is running and air temperature is below 39°F (4°C). CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU. Carbon monoxide is a colorless, odorless, DEADLY POISONOUS gas, and when breathed, deprives body of oxygen and causes SUFFOCATION. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Permanent BRAIN DAMAGE or DEATH can result from severe exposure. Precautions MUST be followed to ensure personnel are safe whenever compartment heater or engine are operated for any purpose. Injury to personnel may result.**
- **DO NOT operate compartment heater or engine of truck in enclosed area without adequate ventilation. BE ALERT at all times whenever BATTERY switch is ON, truck engine is running, and air temperature is below 39°F (4°C) for exhaust symptoms. If either are present, IMMEDIATELY EVACUATE AND VENTILATE the area. Affected personnel treatment shall be: expose to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, give artificial respiration as described in FM 4-25.11 and get medical attention. BE AWARE; neither the gas particulate filter unit nor field protection mask for nuclear-biological-chemical protection will protect you from carbon monoxide poisoning. THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.**

⚠ CAUTION

- **Watch cab instrument panel and pump operator's panel closely. If there are any unusual readings, check as soon as possible!**
- **All snow and ice should be removed from vehicle as soon as possible. Snow and ice may slow or stop movement of critical parts if allowed to pile up.**
- **Special care must be used during operations in extreme cold environment. In extreme cold, water can freeze almost instantly if not circulating. Hoses, plumbing, fittings, pipes, pumps, tanks, turrets, nozzles, drains, etc., can freeze and crack. Foam concentrate may get thick and stiff. Rubber may crack or break easily.**
- **HEWATT has been designed to withstand temperatures down to -25°F (-32°C) for a period no longer than two hours. If either of these limits are exceeded, damage to equipment may result.**
- **During cold weather operations below 20°F (-7°C), Class A foam agent rated for at least -20°F (-29°C) must be used. Failure to comply may result in damage to equipment.**
- **HEWATT must be kept in a protective environment above 55°F (13°C) when water is present in water tank and lines. Only store HEWATT in an unprotected environment with temperatures below 32°F (0°C) if water system has been completely drained and blown out, and foam system has been completely drained. Failure to comply may result in damage to equipment.**
- **In cold weather, valves and drains may become frozen. Do not force valves and drains open or closed. It may be necessary to thaw valves and drains before attempting to open or close. Failure to comply may result in damage to equipment.**

NOTE

A complete HEWATT crew is required to perform firefighting operations.

Refer to the following manuals for additional cold weather operating information:

1. Basic Cold Weather Operations Manual; FM 31-70.
2. Northern Operations; FM 31-71.
3. Operation and Maintenance of Ordnance Material in Cold Weather 0°F to -65°F (-18°C to -54°C); FM 9-207.
4. 8X8 Heavy Expandable Mobility Tactical Trucks (HEMTT) Operator's Manual; TM 9-2320-279-10.
5. First Aid; FM 4-25.11

PREPARATION FOR COLD WEATHER OPERATION

1. Ensure vehicle has been parked in a warm shelter 55°F (13°C) or warmer prior to operations.
2. Ensure onboard water tank is full.
3. Ensure foam agent tank is filled (WP 0021). Use class A foam agent rated for a minimum of -20°F (-29°C).
4. Ensure water pump is drained and in a “dry condition” (WP 0014).
5. Ensure all valves are closed and caps are installed.

OPERATING IN COLD WEATHER

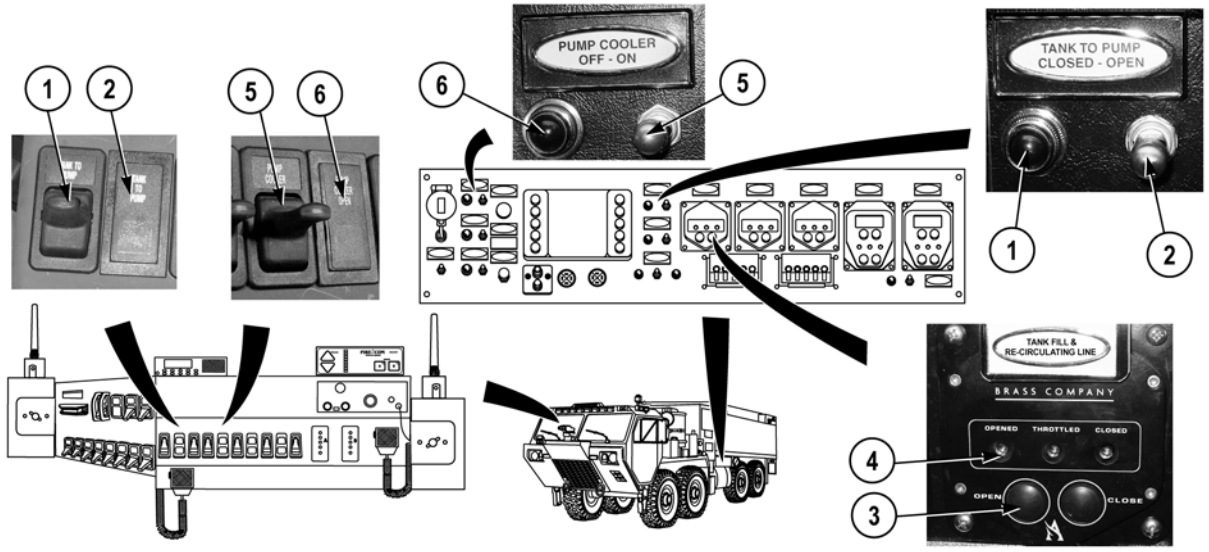
⚠ CAUTION

If main water pump is in a “wet” (flooded) condition during cold weather operations, pump must be engaged and re-circulating water to prevent freezing of pump and plumbing. Failure to comply may result in damage to equipment.

NOTE

Winterization package allows operation of water pump, foam system and body to -25°F (-32°C) for a period of no longer than two hours. This package includes one diesel fired 27,300 BTU heater, located inside pump house compartment. Heater automatically turns on at 39°F (+/- 2°F), 4°C (+/- 1°C), and turns off at 39°F (+/- 3°F), 4°C (+/- 1°C).

1. Start vehicle engine (TM 9-2320-279-10).
2. Proceed to scene.



3. Put TANK TO PUMP switch (1) to OPEN position. Indicator light (2) will illuminate.
4. Prime water pump (WP 0015).

NOTE

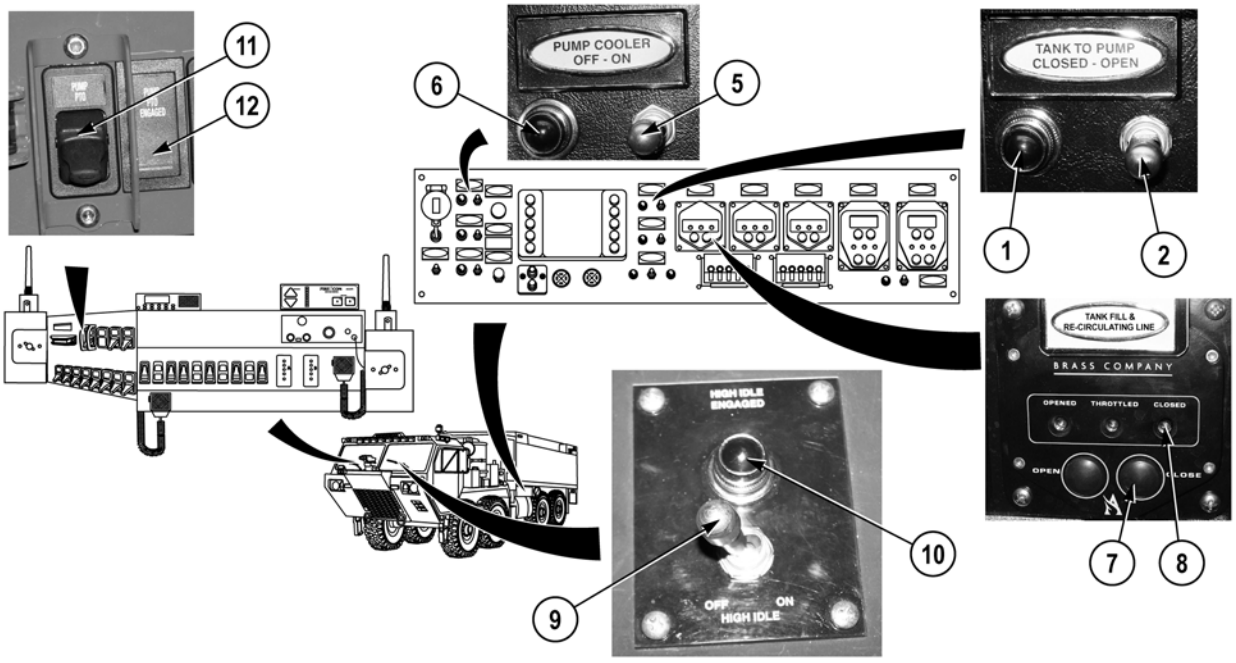
- Perform Steps (5) and (6) only if Steps (3) and (4) have been completed and pumping operations will be delayed, and, if mission exceeds a period of 10 minutes. Partially opening TANK FILL & RE-CIRCULATING LINE valve control at pump operator's panel will recirculate water and help prevent freezing.
- Go to Step (5) if using an operation that does not use foam.
- Go to Step (6) if using an operation that uses foam.

5. Push TANK FILL & RE-CIRCUALTING line valve control OPEN button (3) until green indicator light (4) illuminates.
6. Put PUMP COOLER switch (5) to on position. Indicator light (6) will illuminate.

NOTE

If performing Foam System Operation, Ensure TANK FILL & RE-CIRCULATING LINE valve control is closed and PUMP COOLER valve is in OPEN position.

7. Perform desired discharge operation:
   - Pumping from Onboard Water Tank (WP 0018).
   - Foam System Operating Procedures (Cab and Pump Operator's Panel) (WP 0023).
8. Complete mission.



CAUTION

Once mission is complete, ensure onboard water tank is empty. Stopping and starting pumping operations may allow water to freeze, causing damage to equipment. If water tank is not emptied, exposed components may freeze, causing damage to equipment.

9. Pump out or discharge water until water tank is empty.

NOTE

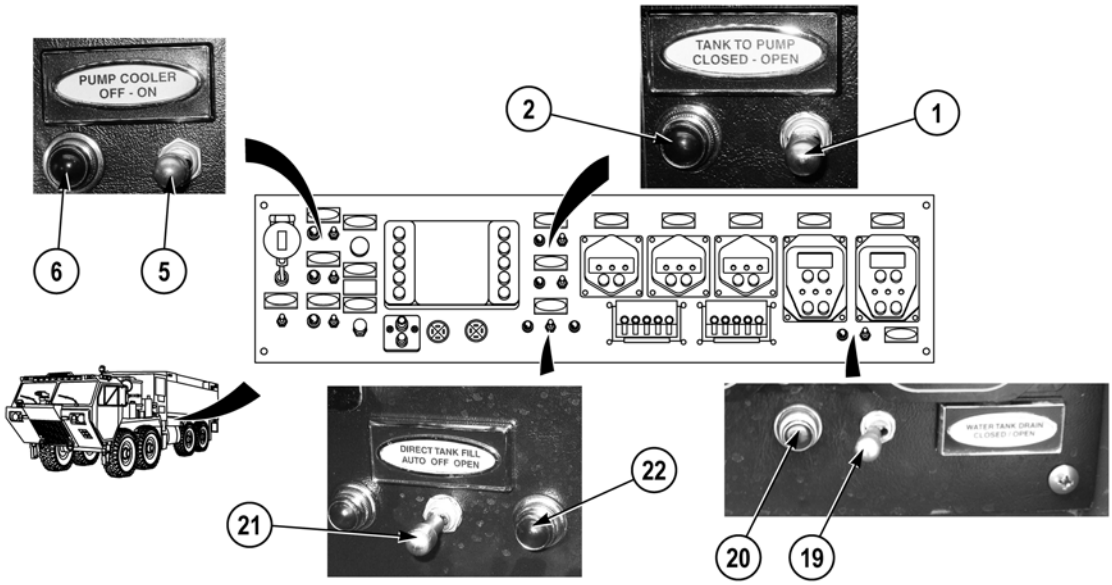
- Go to Step (10) if foam system operations were required.
- Go to Step (11) if foam system operations were not required.

10. Put PUMP COOLER switch (5) to off position. Indicator light (6) will go out.
11. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (7) until red indicator light (8) illuminates.
12. Put HIGH IDLE switch (9) to OFF position. Indicator light (10) will go out.
13. Put PUMP PTO switch (11) to off position. Indicator light (12) will go out.
14. Put TANK TO PUMP switch (1) to CLOSE position. Indicator light (2) will go out.

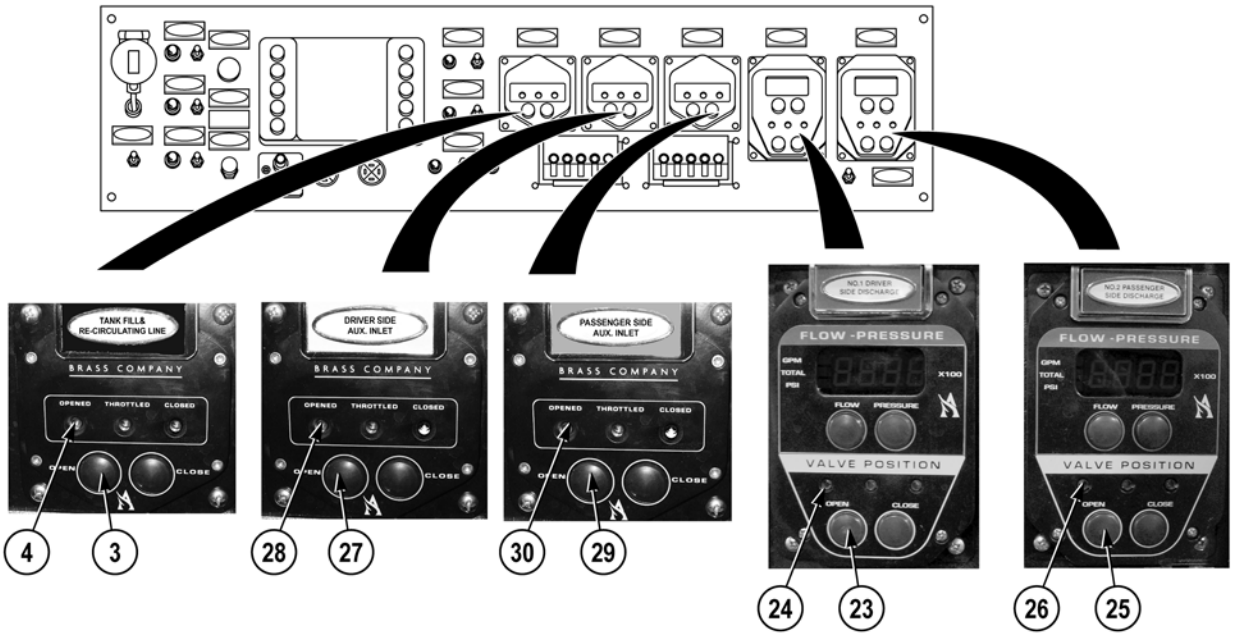
NOTE

Do not open any foam agent supply valves. This will contaminate water tank.

15. Remove DRIVER SIDE AUX. INLET cap (13), NO. 1 DRIVER SIDE DISCHARGE cap (14), PASSENGER SIDE AUX. inlet cap (15), NO. 2 PASSENGER SIDE DISCHARGE cap (16), main inlet cap (17), and DIRECT TANK FILL cap (18).



16. Put WATER TANK DRAIN switch (19) to OPEN position. Indicator light (20) will illuminate.
17. Put TANK TO PUMP switch (1) to OPEN position. Indicator light (2) will illuminate.
18. Put DIRECT TANK FILL switch (21) to OPEN position. Indicator light (22) will illuminate.
19. Put PUMP COOLER switch (5) to ON position. Indicator light (6) will illuminate.



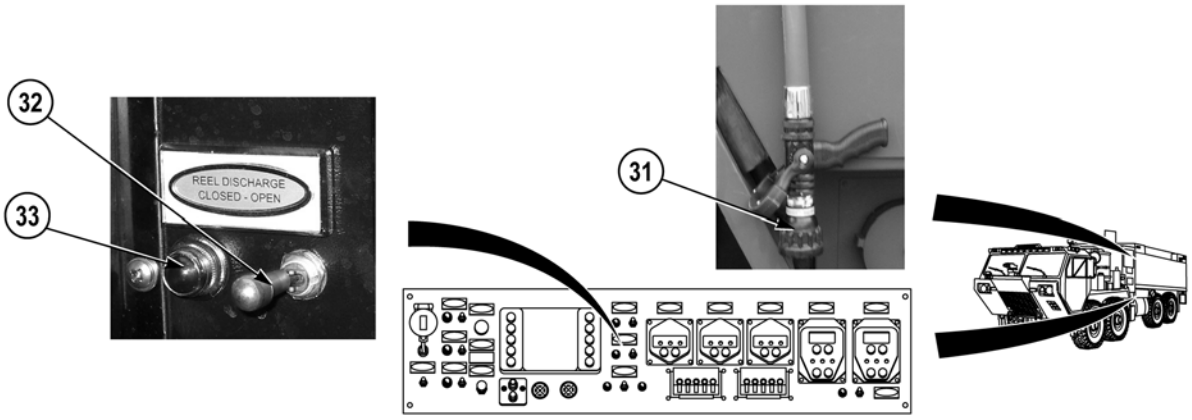
20. Push TANK FILL & RE-CIRCULATING LINE valve control OPEN button (3) until green indicator light (4) illuminates.

21. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (23) until green indicator light (24) illuminates.

22. Push NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN button (25) until green indicator light (26) illuminates.

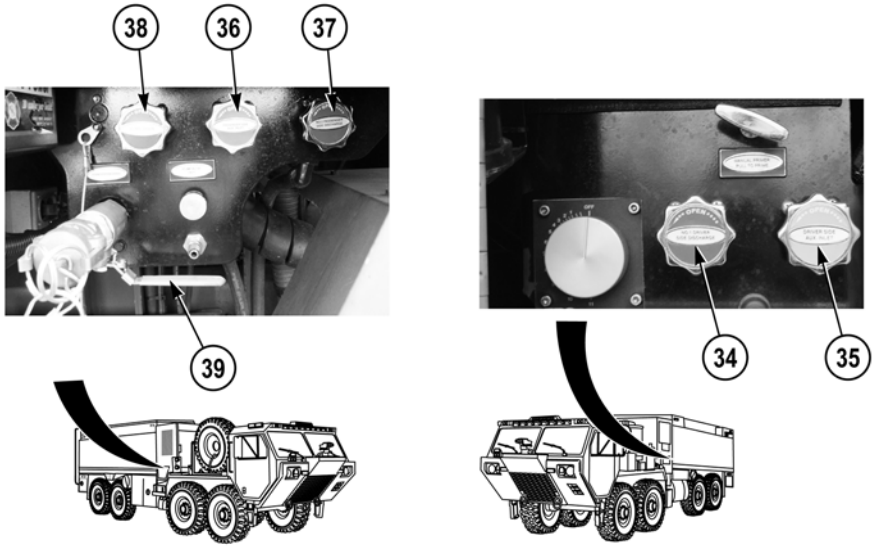
23. Push DRIVER SIDE AUX. INLET valve control OPEN button (27) until green indicator light (28) illuminates.

24. Push PASSENGER SIDE AUX. INLET valve control OPEN button (29) until green indicator light (30) illuminates.



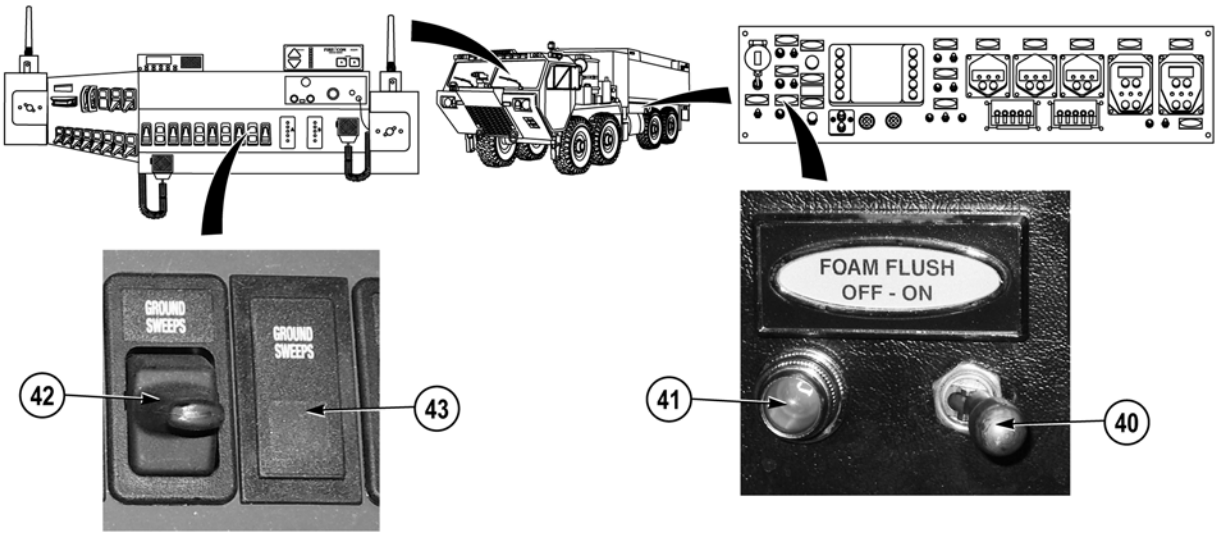
25. Pull hose away from vehicle and put hose reel nozzle (31) in OPEN position.

26. Put REEL DISCHARGE switch (32) to OPEN position. Indicator light (33) will illuminate.



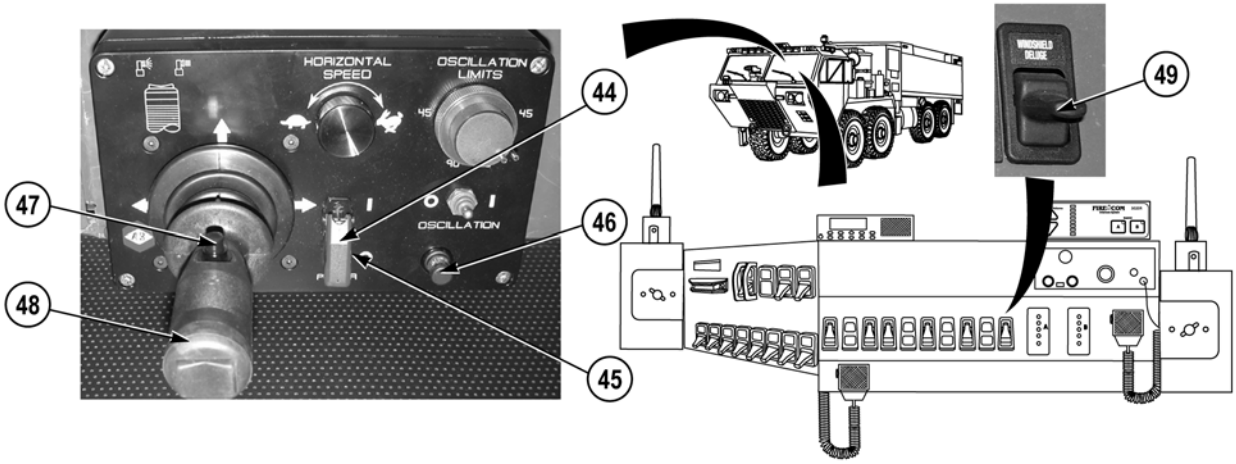
27. Open NO. 1 DRIVER SIDE DISCHARGE (34), DRIVER SIDE AUX. INLET (35), NO. 2 PASSENGER SIDE DISCHARGE (36), PASSENGER SIDE AUX. INLET (37), and PUMP DRAIN (38) valves.

28. Remove cap and put FOAM TANK DRAIN valve (39) to open position.



29. Put FOAM FLUSH switch (40) to ON position. Indicator light (41) will illuminate.

30. Put UNDER TRUCK NOZZLES switch (42) to on position. Indicator light (43) will illuminate.



WARNING

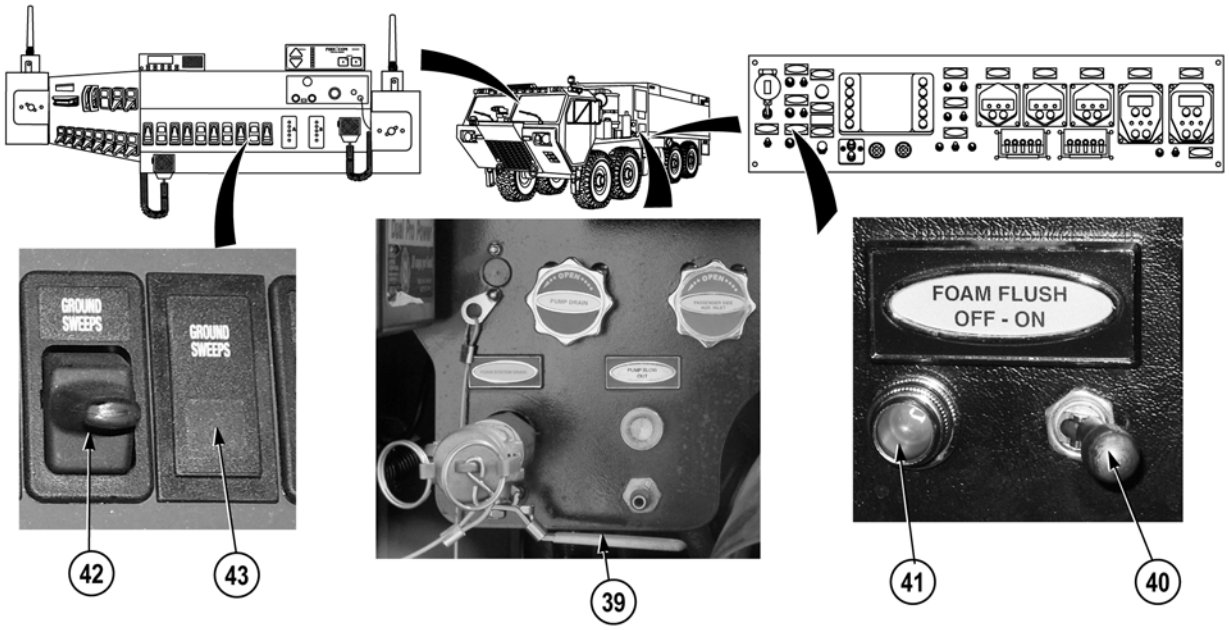
Turrets should never be pointed at personnel. Failure to comply may result in injury or death to personnel.

31. Lift bumper turret power switch guard (44) and put POWER switch (45) to **|** (on) position. Indicator light (46) will illuminate.
32. Push and release agent discharge button (47) on front of joystick control handle (48) to begin discharge.
33. Put WINDSHIELD DELUGE switch (49) to on position, and discharge water for 15 to 30 seconds.
34. Put WINDSHIELD DELUGE switch (49) to off position.
35. Push battery disconnect to off position (WP 0007).

NOTE

All valves should be left open for 24 hours, to allow for evaporation of water from system.

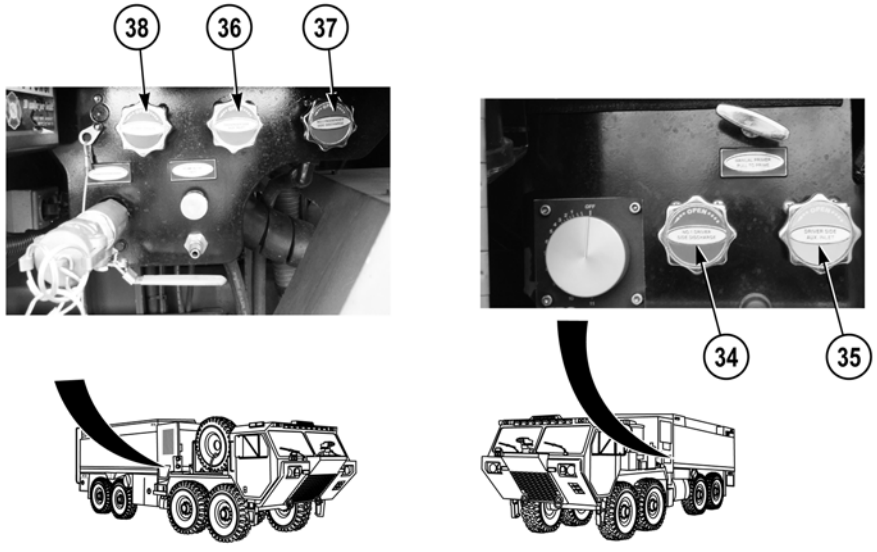
36. Pull battery disconnect to on position (WP 0007).
37. Push and release agent discharge button (47) on front of joystick control handle (48) to stop discharge.
38. Put POWER switch (45) to ○ (off) position. Indicator light (46) will go out.



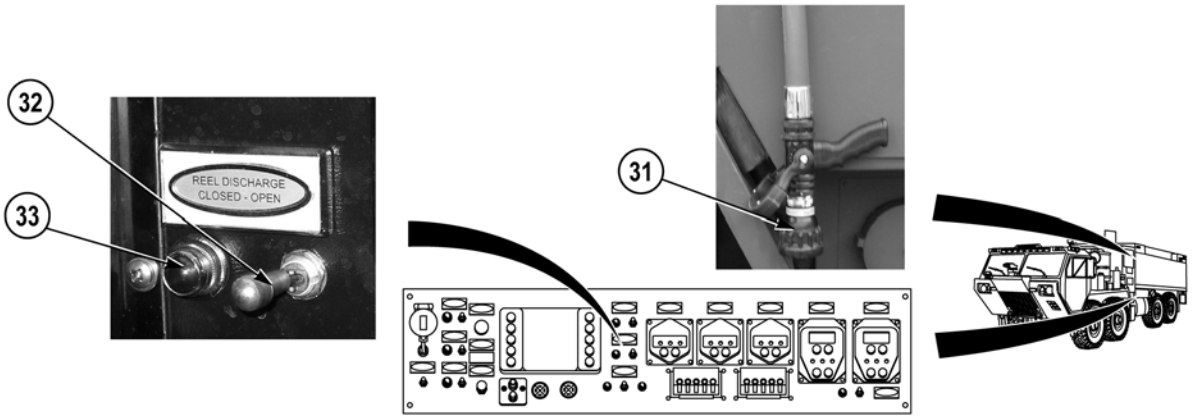
39. Put UNDER TRUCK NOZZLES switch (42) to off position. Indicator light (43) will go out.

40. Put FOAM FLUSH switch (40) to ON position. Indicator light (41) will illuminate.

41. Put FOAM TANK DRAIN valve (39) in closed position and install cap.

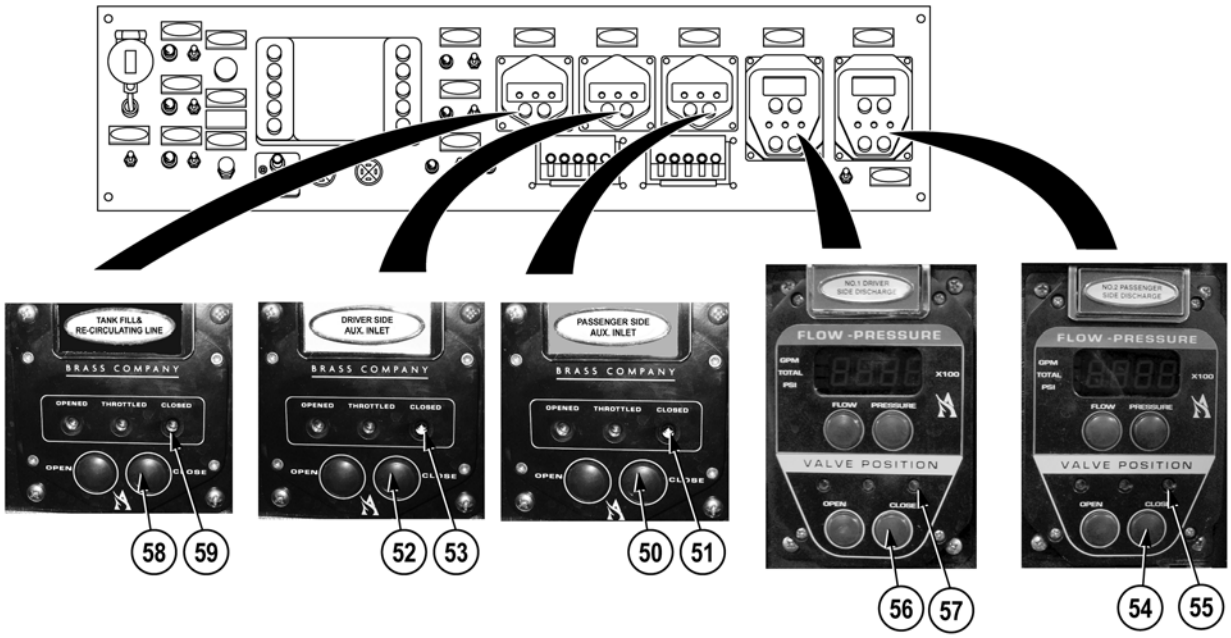


42. Close NO. 1 DRIVER SIDE DISCHARGE (34), DRIVER SIDE AUX. INLET (35), NO. 2 PASSENGER SIDE DISCHARGE (36), PASSENGER SIDE AUX. INLET (37), and water PUMP DRAIN (38) valves.



43. Put hose reel nozzle (31) in closed position and stow hose on hose reel (WP 0024).

44. Push REEL DISCHARGE switch (32) to CLOSED position. Indicator light (33) will go out.



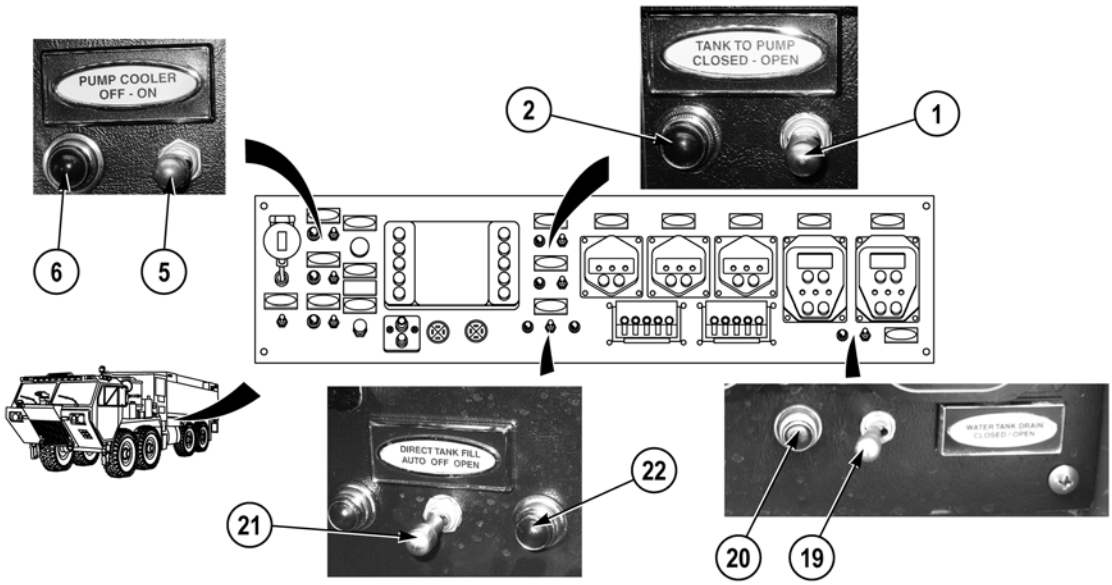
45. Push PASSENGER SIDE AUX. INLET valve control CLOSE button (50) until red indicator light (51) illuminates.

46. Push DRIVER SIDE AUX. INLET valve control CLOSE button (52) until red indicator light (53) illuminates.

47. Push NO. 2 PASSENGER SIDE DISCHARGE valve control CLOSE button (54) until red indicator light (55) illuminates.

48. Push NO. 1 DRIVER SIDE DISCHARGE valve control CLOSE button (56) until red indicator light (57) illuminates.

49. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (58) until red indicator light (59) illuminates.



50. Put PUMP COOLER switch (5) to OFF position. Indicator light (6) will go out.
51. Put DIRECT TANK FILL switch (21) to OFF position. Indicator light (22) will go out.
52. Put TANK TO PUMP switch (1) to CLOSED position. Indicator light (2) will go out.
53. Put WATER TANK DRAIN switch (19) to CLOSED position. Indicator light (20) will go out.

54. Install DRIVER SIDE AUX. INLET cap (13), NO. 1 DRIVER SIDE DISCHARGE cap (14), PASSENGER SIDE AUX. INLET cap (15), NO. 2 PASSENGER SIDE DISCHARGE cap (16), main inlet cap (17), and DIRECT TANK FILL cap (18).

END OF TASK

FOLLOW-ON MAINTENANCE

If vehicle is to be stored outside in freezing temperatures, perform Pump and Plumbing Blowout Procedures (WP 0032).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

OPERATION IN EXTREME HOT ENVIRONMENT 105°F (40°C) OR ABOVE

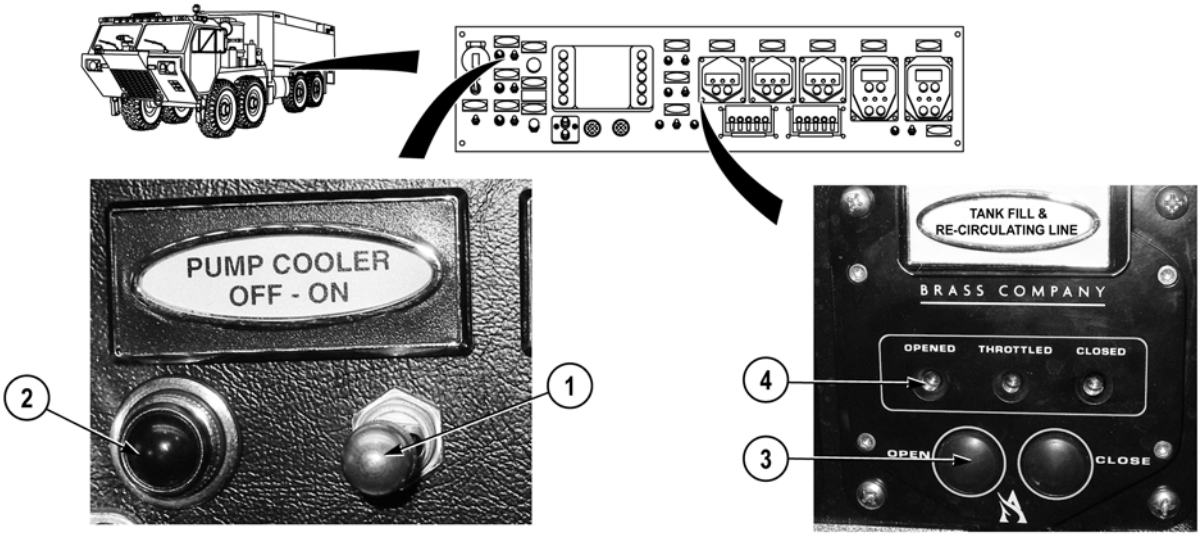
OPERATIONS IN EXTREME HOT ENVIRONMENT

⚠ CAUTION

- **These steps must be performed when temperatures are 105°F (40°C) or above. Failure to comply may result in damage to equipment.**
- **Perform Step (1) prior to operating priming pump. Failure to comply may result in damage to equipment.**

STARTING OPERATIONS

1. Fill priming pump water tank with water prior to operating priming pump (WP 0126).



NOTE

Perform Step (2) if pumping from hydrant, relay, or draft (WP 0017 or WP 0019).

2. Turn PUMP COOLER switch (1) to ON position. Indicator light (2) will illuminate.

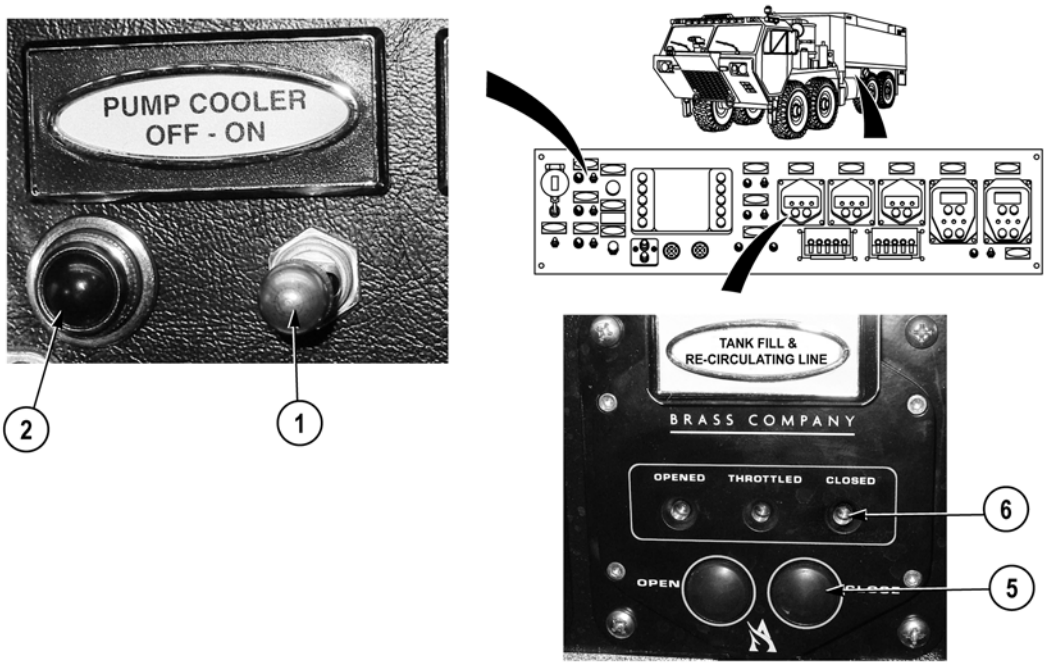
NOTE

Perform Step (3) if pumping from onboard water tank (WP 0018).

3. Push TANK FILL & RE-CIRCULATING LINE valve control OPEN button (3) until green indicator light (4) illuminates.
4. Complete mission.

END OF TASK

STOPPING OPERATIONS



NOTE

Perform Step (1) if pumping from hydrant, relay, or draft was required.

1. Turn PUMP COOLER switch (1) to OFF position. Indicator light (2) will go out.

NOTE

Perform Step (2) if pumping from onboard water tank was required.

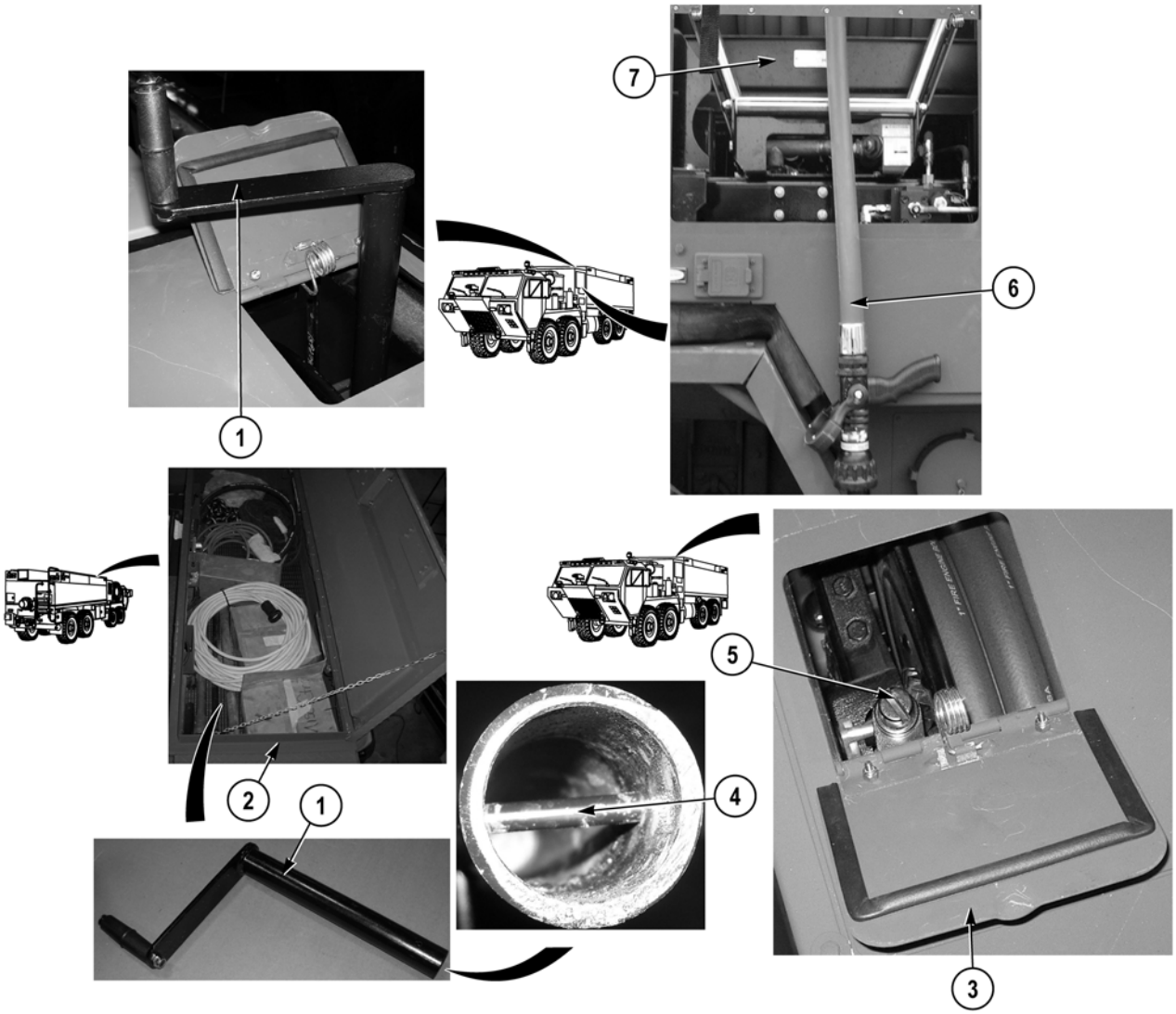
2. Push TANK FILL & RE-CIRCULATING LINE valve control CLOSE button (5) until red indicator light (6) illuminates.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

MANUAL HOSE REEL REWIND



1. Unstow right rear access ladder (WP 0012).
2. Remove handle (1) from stowage compartment (2).
3. Open pump house panel L access door (3).
4. Insert handle (1) through pump house panel L access door (3).
5. Slowly turn handle (1) until roll pin (4) seats in pin slot (5).
6. Turn handle (1) clockwise until hose (6) is fully wound on hose reel (7).
7. Remove handle (1) from pump house panel L access door (3).

8. Close pump house panel L access door (3).
9. Stow handle (1) in stowage compartment (2).

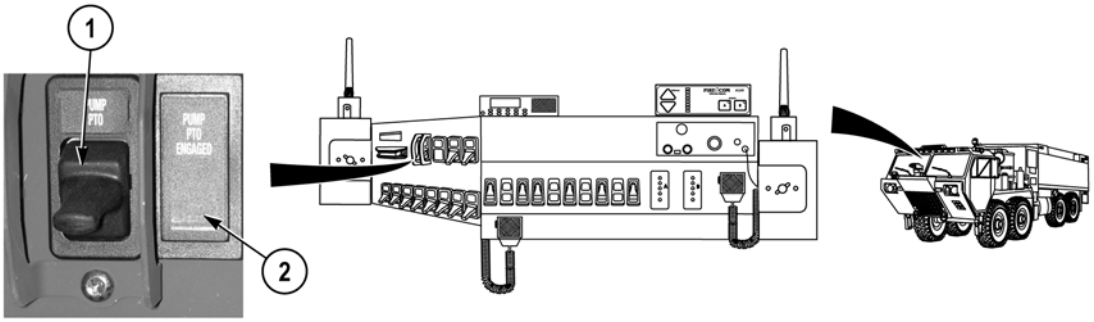
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

MANUAL PRIMING PUMP OPERATION

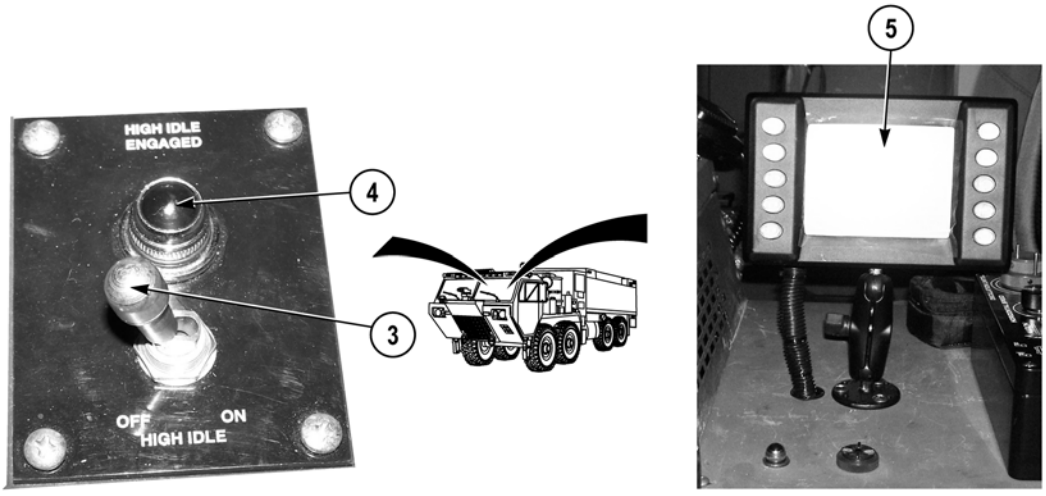
MANUAL PRIMING PUMP OPERATION (CAB)



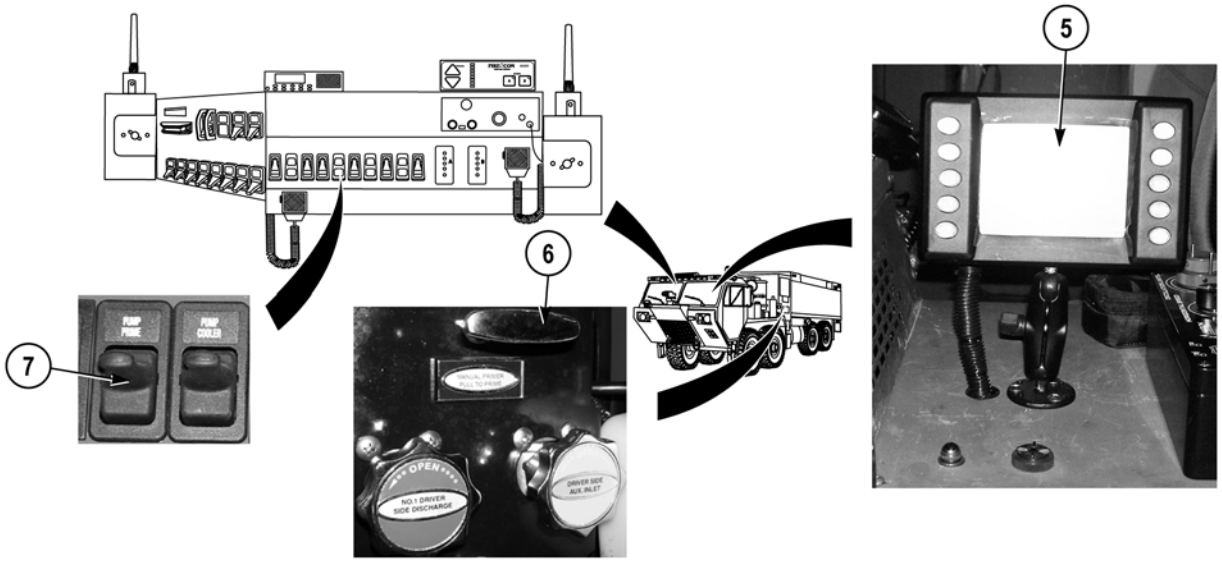
NOTE

Ensure water source is available before performing pump priming function.

1. Prepare vehicle for required pumping operations.
2. Start engine (TM 9-2320-279-10).
3. Turn PUMP PTO switch (1) to on position. Indicator light (2) will illuminate.



4. Put HIGH IDLE switch (3) to ON position. Indicator light (4) will illuminate.
5. Enable cab pressure governor operation (WP 0016).
6. Set pressure governor (5) to operating pressure (WP 0016).



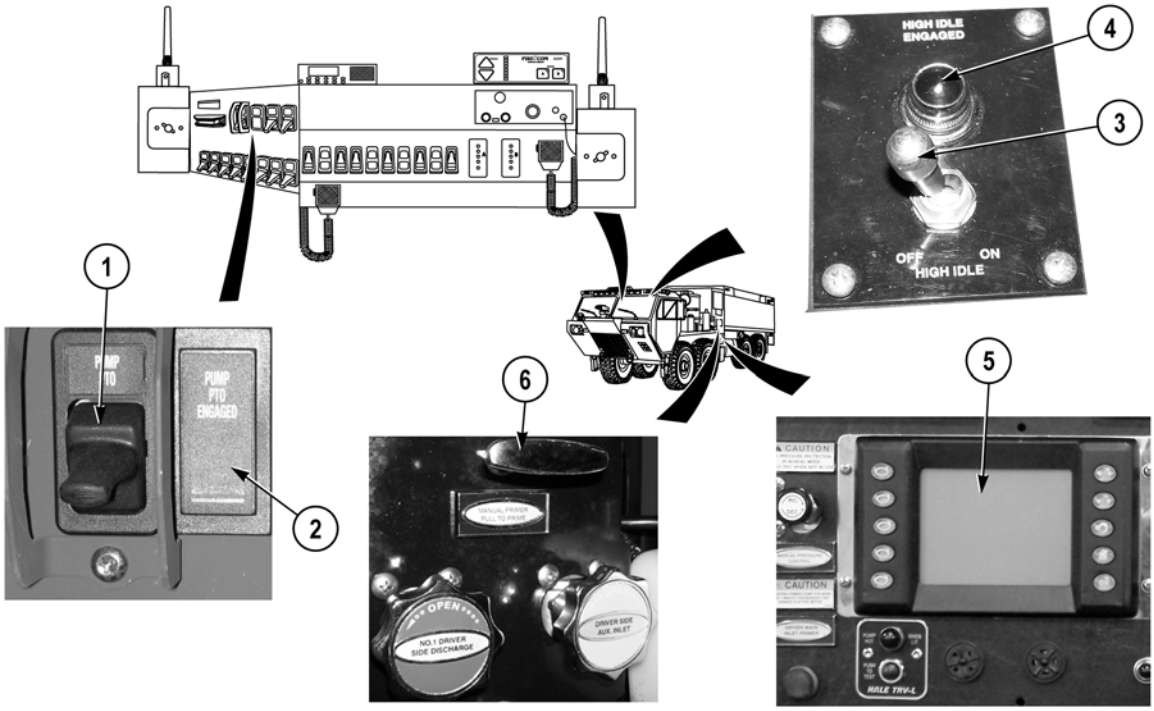
⚠ CAUTION

If discharge gauge reading does not increase, or priming pump does not discharge water to ground in 60 seconds, do not continue running priming pump. Stop water pump, or damage to equipment may result.

7. Pull MANUAL PRIMER handle (6) to open position.
8. Push and hold PUMP PRIME switch (7) to on position.
9. Ensure pressure governor (5) displays water pressure on pump discharge display.
10. If pressure governor (5) displays water pressure, release PUMP PRIME switch (7) to off position.
11. Push MANUAL PRIMER handle (6) to closed position.
12. Proceed with mission.

END OF TASK

MANUAL PRIMING PUMP OPERATION (PUMP OPERATOR'S PANEL)



NOTE

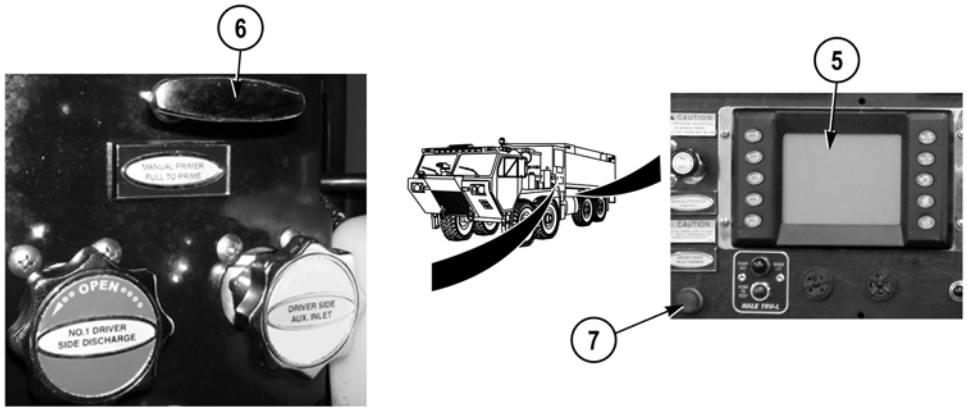
Ensure water source is available before performing pump priming function.

1. Start engine (TM 9-2320-279-10).
2. Turn PUMP PTO switch (1) to on position. Indicator light (2) will illuminate.
3. Put HIGH IDLE switch (3) to ON position. Indicator light (4) will illuminate.
4. Set pressure governor (5) to operating pressure (WP 0016).

⚠ CAUTION

If discharge gauge reading does not increase, or priming pump does not discharge water to ground in 60 seconds, do not continue running priming pump. Stop water pump, or damage to equipment may result.

5. Pull MANUAL PRIMER handle (6) to open position.



6. Push and hold DRIVER MAIN INLET PRIMER button (7).
7. Ensure pressure governor (5) displays water pressure on pump discharge display.
8. If pressure governor (5) displays water pressure, release DRIVER MAIN INLET PRIMER button (7).
9. Push MANUAL PRIMER HANDLE (6) to closed position.
10. Proceed with mission.

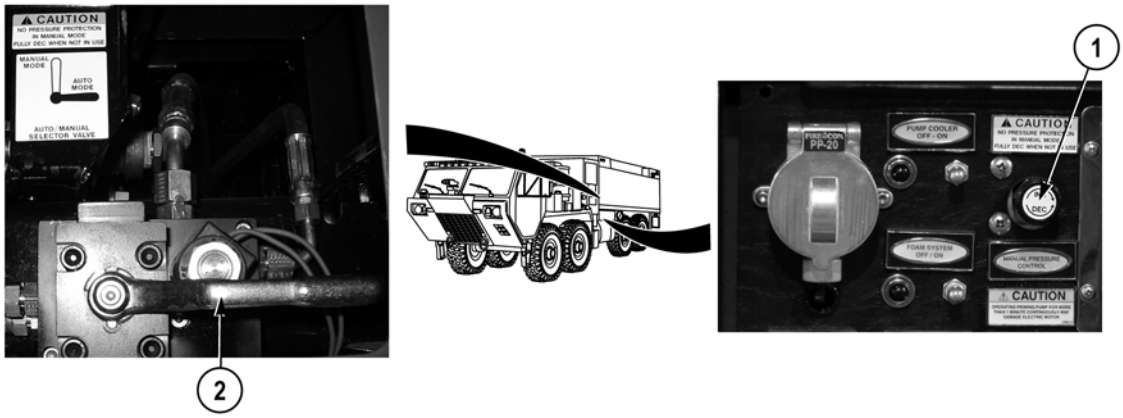
END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PUMPING OPERATIONS (MANUAL OVERRIDE)

STARTING MANUAL OVERRIDE PUMPING OPERATIONS



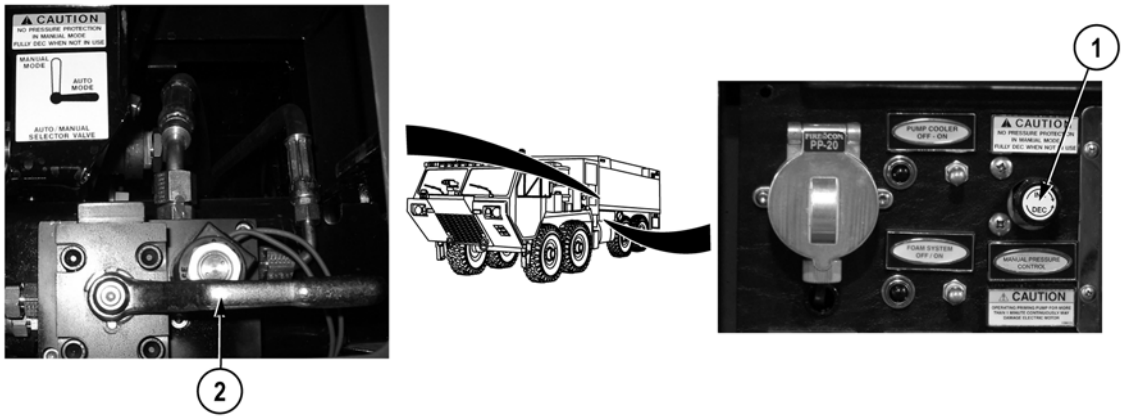
WARNING

There is no pressure protection in manual mode. Fully decrease (DEC) pressure when not in use. Failure to comply may cause damage to equipment and/or death or injury to personnel.

1. Prepare vehicle for required pumping operations.
2. Turn MANUAL PRESSURE CONTROL knob (1) counterclockwise to fully DEC (decreased) position.
3. Open pump house access door assembly (WP 0009).
4. Turn AUTO/MANUAL SELECTOR VALVE handle (2) to MANUAL MODE position.
5. Turn MANUAL PRESSURE CONTROL knob (1) clockwise to INC (increase) pump pressure to desired setting.
6. Complete mission.

END OF TASK

STOPPING MANUAL OVERRIDE PUMPING OPERATIONS



WARNING

There is no pressure protection in manual mode. Fully decrease (DEC) pressure when not in use. Failure to comply may cause damage to equipment and/or death or injury to personnel.

1. Turn MANUAL PRESSURE CONTROL knob (1) counterclockwise to fully DEC (decreased) position.
2. Turn AUTO/MANUAL SELECTOR VALVE handle (2) to AUTO MODE position.
3. Close pump house access door assembly (WP 0009).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

STOWAGE AND DATA PLATE GUIDE

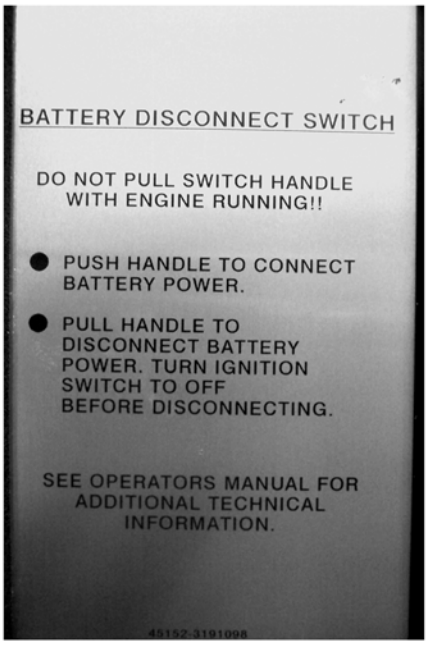
SCOPE

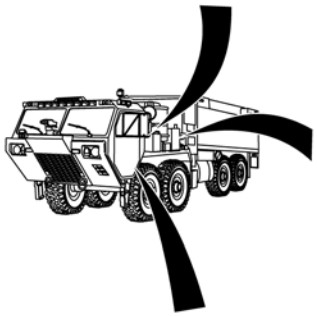
This work package shows locations for data plates, decals, and stencils that are to be in place on the M1158 series vehicle.

GENERAL

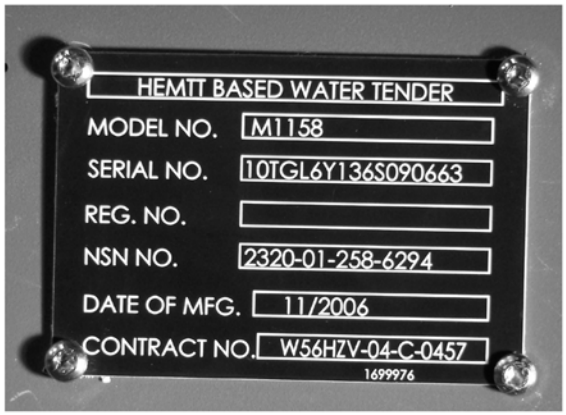
The figures on the next pages show location of metal signs, decals, and stencils used on the vehicle. Most of these signs and stencils contain WARNINGS or CAUTIONS or information needed to operate the vehicle safely. For stowage locations of Components of End Items (COEI) refer to WP 0039.

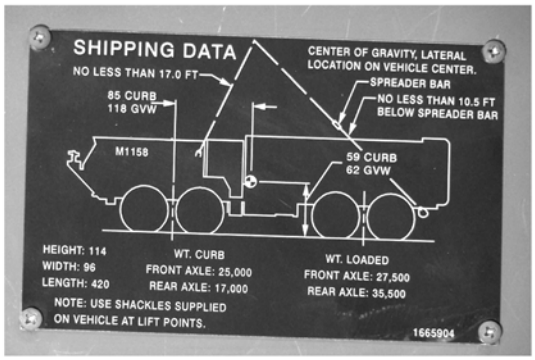
CAUTION
HIGH INTENSITY NOISE
HEARING PROTECTION REQUIRED
1410640

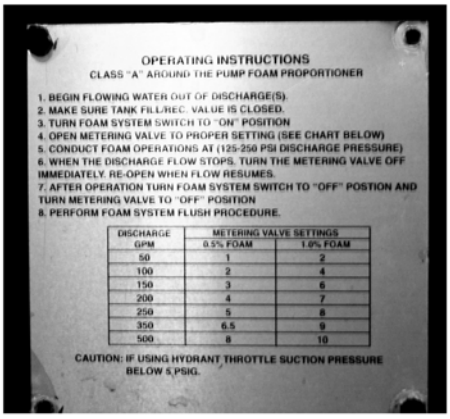

BATTERY DISCONNECT SWITCH
DO NOT PULL SWITCH HANDLE WITH ENGINE RUNNING!!
PUSH HANDLE TO CONNECT BATTERY POWER.
PULL HANDLE TO DISCONNECT BATTERY POWER. TURN IGNITION SWITCH TO OFF BEFORE DISCONNECTING.
SEE OPERATORS MANUAL FOR ADDITIONAL TECHNICAL INFORMATION.
45152-3191098

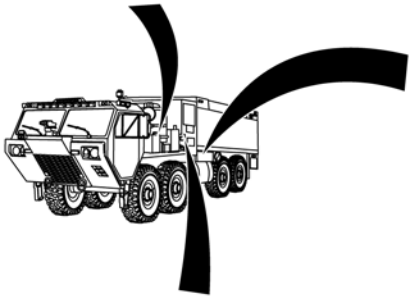


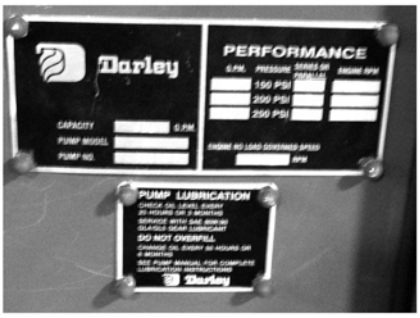
WARNING
CAUTION
DIESEL HEATER EXHAUST EMITS CARBON MONOXIDE. DIESEL HEATERS MAY OPERATE AUTOMATICALLY WHENEVER VEHICLE IGNITION SWITCH IS "ON". DO NOT OPERATE IN ENCLOSED SPACES.
DEATH OR SERIOUS INJURY MAY RESULT.
CAUTION
CONTAINS R -134A
DANGER
OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION
CAUTION
WHEN OPERATING IN COLD ENVIRONMENT (-40 DEGREES F TO 32 DEGREES F) REFER TO THE OPERATING IN COLD ENVIRONMENT SECTION OF THE OPERATORS MANUAL


HEMTT BASED WATER TENDER
MODEL NO. M1158
SERIAL NO. 10TGL6Y136S090663
REG. NO.
NSN NO. 2320-01-258-6294
DATE OF MFG. 11/2006
CONTRACT NO. W56HZV-04-C-0457
1699976

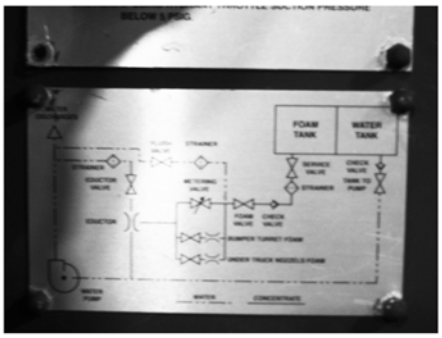

SHIPPING DATA
NO LESS THAN 17.0 FT
85 CURB
118 GVW
CENTER OF GRAVITY, LATERAL LOCATION ON VEHICLE CENTER.
SPREADER BAR
NO LESS THAN 10.5 FT BELOW SPREADER BAR
M1158
59 CURB
62 GVW
HEIGHT: 114
WIDTH: 96
LENGTH: 420
WT. CURB
FRONT AXLE: 25,000
REAR AXLE: 17,000
WT. LOADED
FRONT AXLE: 27,500
REAR AXLE: 35,500
NOTE: USE SHACKLES SUPPLIED ON VEHICLE AT LIFT POINTS.
1665904

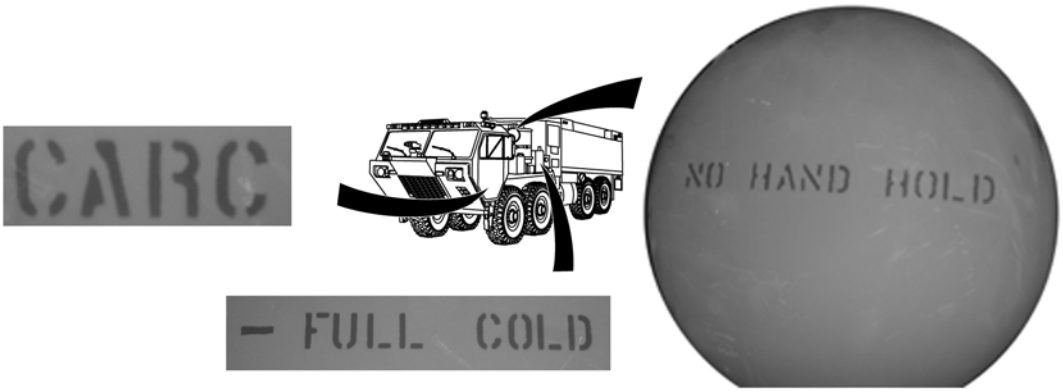

OPERATING INSTRUCTIONS
CLASS "A" AROUND THE PUMP FOAM PROPORTIONER
1. BEGIN FLOWING WATER OUT OF DISCHARGE(S).
2. MAKE SURE TANK FILL/REC. VALVE IS CLOSED.
3. TURN FOAM SYSTEM SWITCH TO "ON" POSITION
4. OPEN METERING VALVE TO PROPER SETTING (SEE CHART BELOW)
5. CONDUCT FOAM OPERATIONS AT (125-250 PSI DISCHARGE PRESSURE)
6. WHEN THE DISCHARGE FLOW STOPS, TURN THE METERING VALVE OFF IMMEDIATELY. RE-OPEN WHEN FLOW RESUMES.
7. AFTER OPERATION TURN FOAM SYSTEM SWITCH TO "OFF" POSTION AND TURN METERING VALVE TO "OFF" POSITION
8. PERFORM FOAM SYSTEM FLUSH PROCEDURE.
DISCHARGE GPM
METERING VALVE SETTINGS
0.5% FOAM
1.0% FOAM
50 1 2
100 2 4
150 3 6
200 4 7
250 5 8
350 6.5 9
500 8 10
CAUTION: IF USING HYDRANT THROTTLE SUCTION PRESSURE BELOW 5 PSIG.

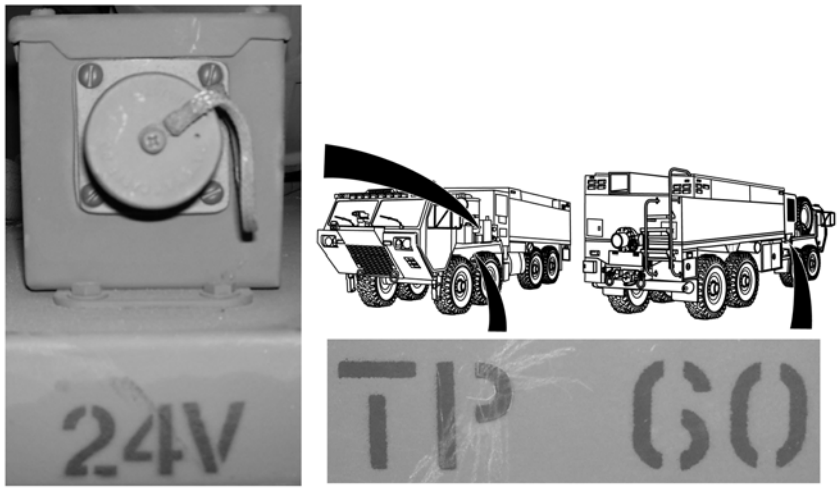


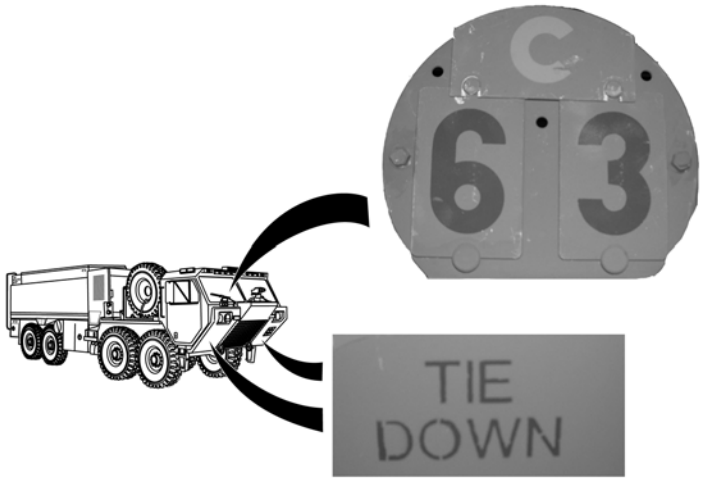

Darley
PERFORMANCE
CAPACITY
G.P.M.
PUMP MODEL
PUMP NO.
PUMP LUBRICATION
DO NOT OVERFILL

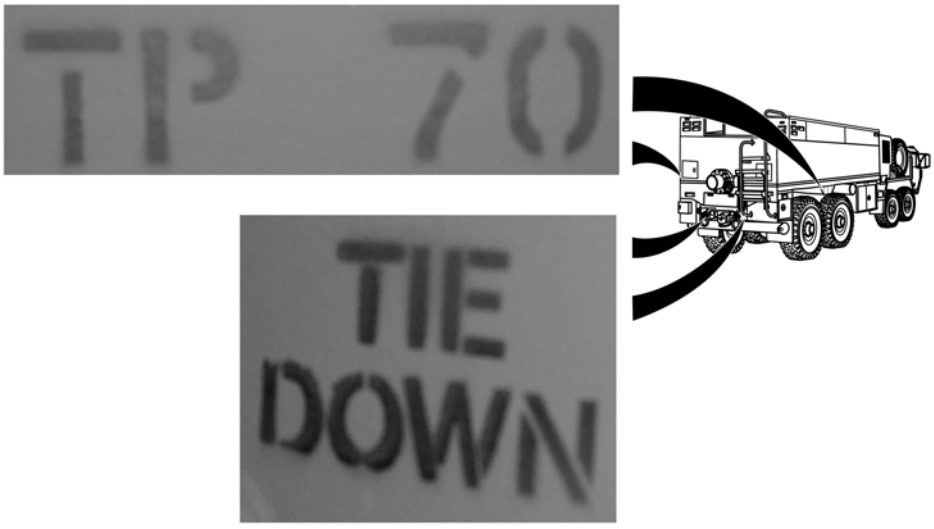
WARNING
SERIOUS INJURY OR DEATH COULD OCCUR IF
INLET (S) IS SUPPLIED BY A PRESSURIZED
SOURCE WHEN THE VALVE IS CLOSED.
91-0359-0002

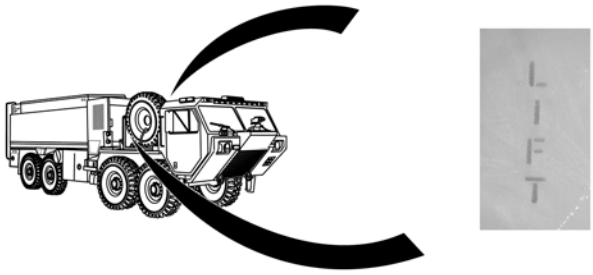

FOAM TANK
WATER TANK

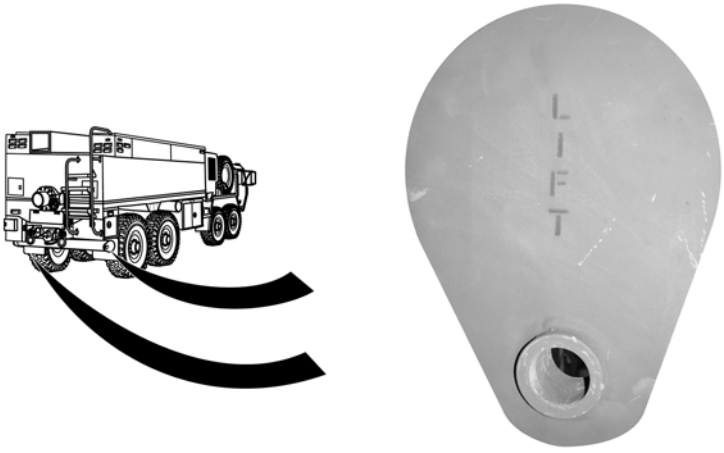

CARC
NO HAND HOLD
– FULL COLD

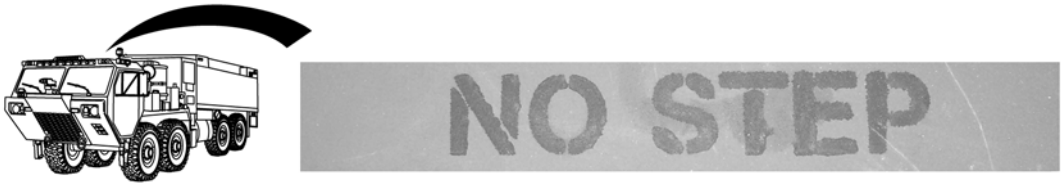

24V
TP GO


C
6 3
TIE
DOWN


TIE
DOWN







END OF WORK PACKAGE

OPERATOR MAINTENANCE

ON-TRUCK LOAD PLAN

SCOPE

This work package shows stowage locations for COEI and BII equipment necessary to support the vehicle.

GENERAL

Stowage locations are shown for equipment that must accompany the vehicle at all times. The BII and COEI items are covered in this work package.

Figure 1. shows the location of all stowage compartments on the vehicle.

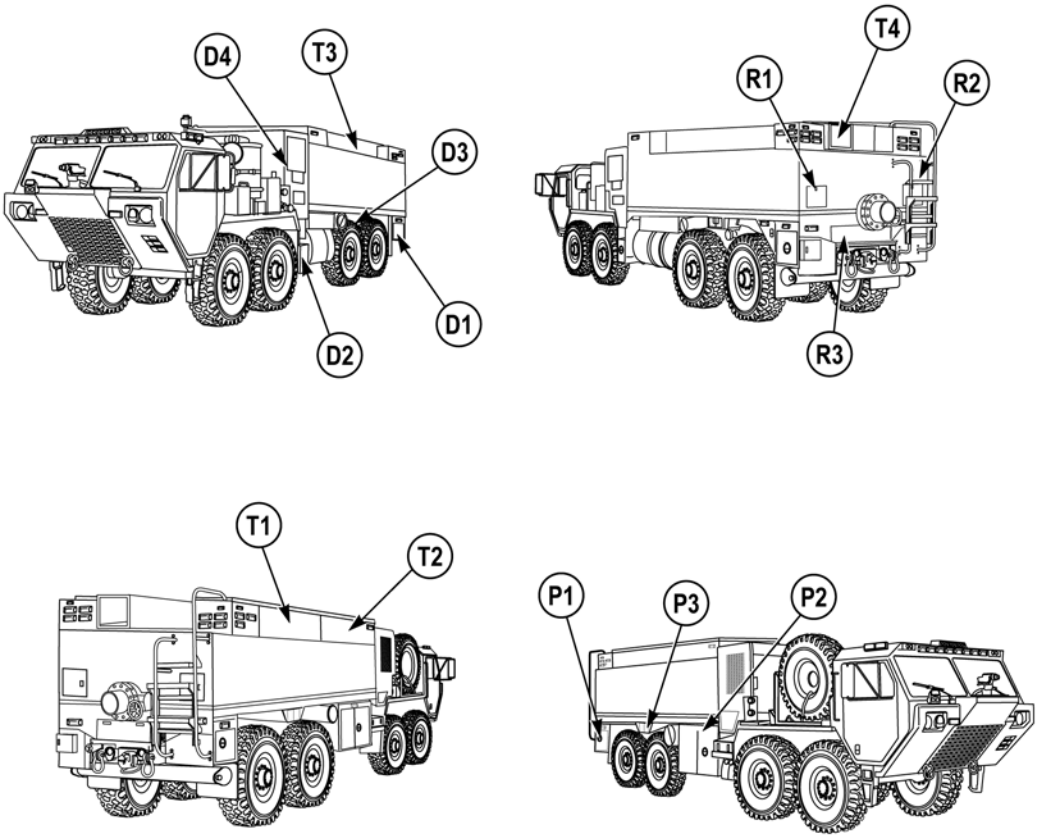


Figure 1. Location of Stowage Compartments.

ON-TRUCK LOAD PLAN

Table 1. Load Plan (Cab).

NO.	ITEM	QTY.
1	Fire Extinguisher	1

Table 2. Load Plan (Cab).

NO.	ITEM	QTY.
1	Tool Bag and Tools	1
2	Pamphlet Bag and Binder	1
3	Operator Manual	1

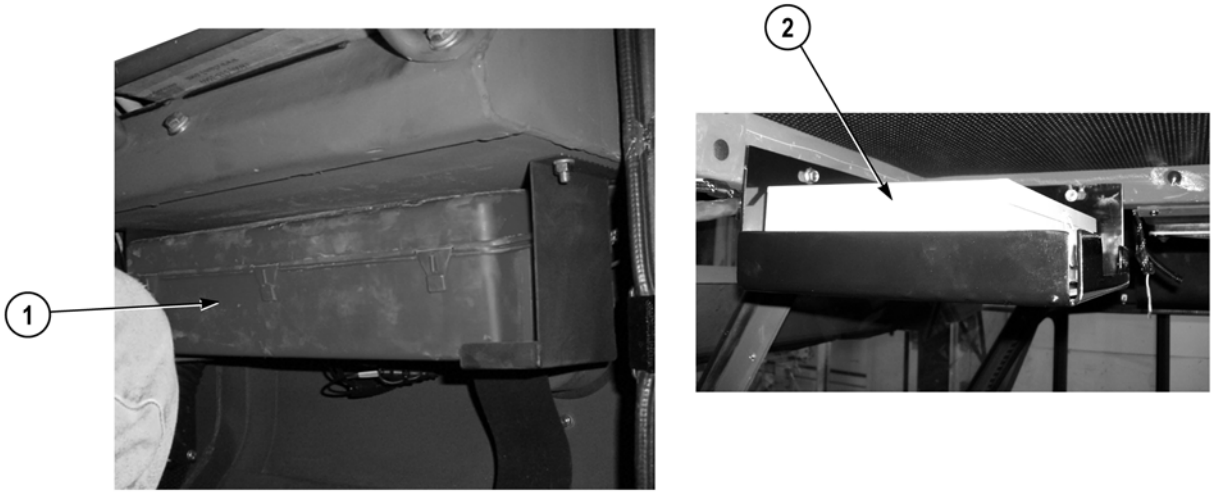


Table 3. Load Plan (Cab).

NO.	ITEM	QTY.
1	Highway Warning Kit	1
2	First Aid Kit	1

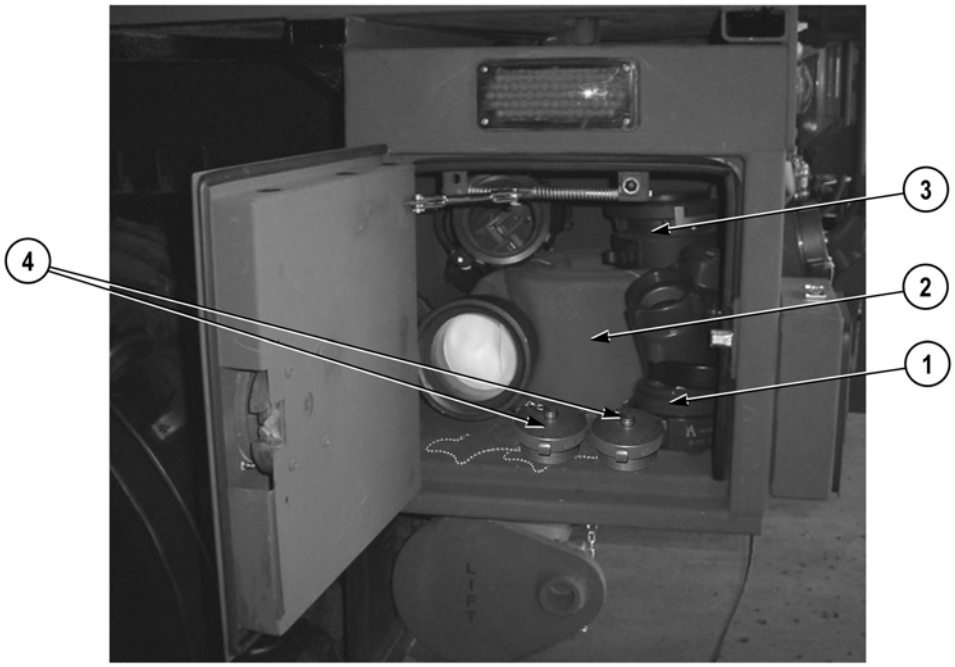


Table 4. Load Plan (Stowage Compartment D1).

NO.	ITEM	QTY.
1	Siamese Fitting 2 - 2.5 in. FNST x 4 in. FNST	1
2	Soft Discharge Hose 5 in. x 20 ft.	1
3	Adapter 5 in. Storz	1
4	2.5 in. Plug NST, Male	2

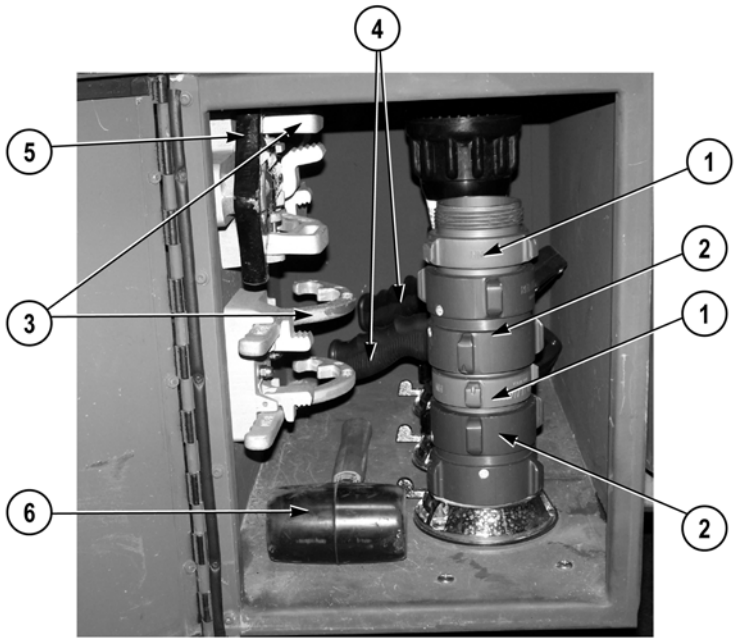


Table 5. Load Plan (Stowage Compartment D2).

NO.	ITEM	QTY.
1	2-1/2 in. to 2-1/2 in. Male Adapters	2
2	2-1/2 in. to 2-1/2 in. Female Adapters	2
3	Spanner Wrenches and Holders	4
4	2-1/2 in. Hose Nozzles	2
5	Hydrant Wrench	1
6	Mallet, Rubber	1

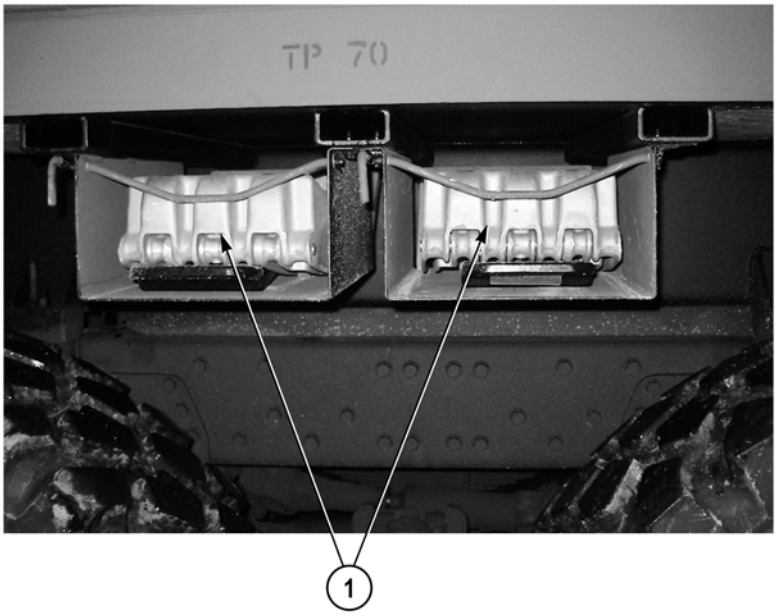


Table 6. Load Plan (Stowage Compartment D3).

NO.	ITEM	QTY.
1	Chocks, Wheel, ZICO FOLDING	2

Table 7. Load Plan (Stowage Compartment D4).

NO.	ITEM	QTY.
1	1 in. Nozzle, Ultimatic W/Grip	1

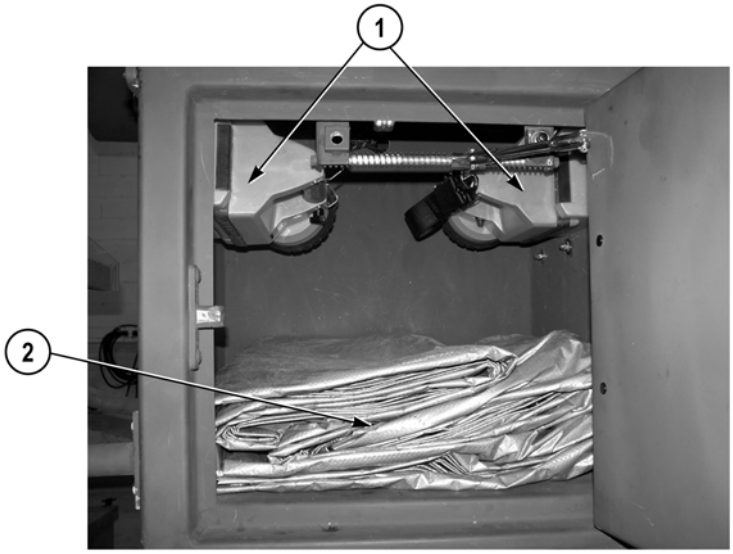


Table 8. Load Plan (Stowage Compartment P1).

NO.	ITEM	QTY.
1	Streamlights w/Charges	2
2	Tarp, Ground Cover, Folding Tank	1

Table 9. Load Plan (Stowage Compartment P2).

NO.	ITEM	QTY.
1	Pre-filter and Float	1

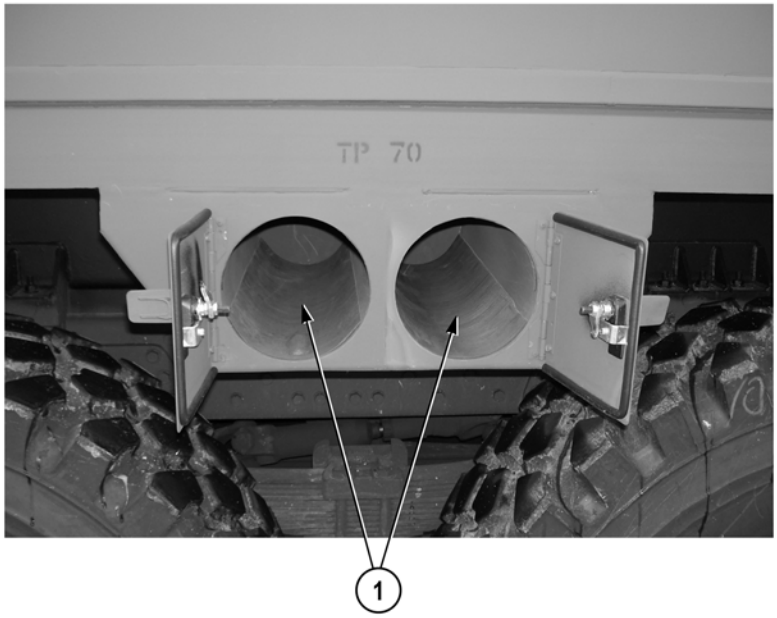


Table 10. Load Plan (Stowage Compartment P3).

NO.	ITEM	QTY.
1	SCBA Tanks	2

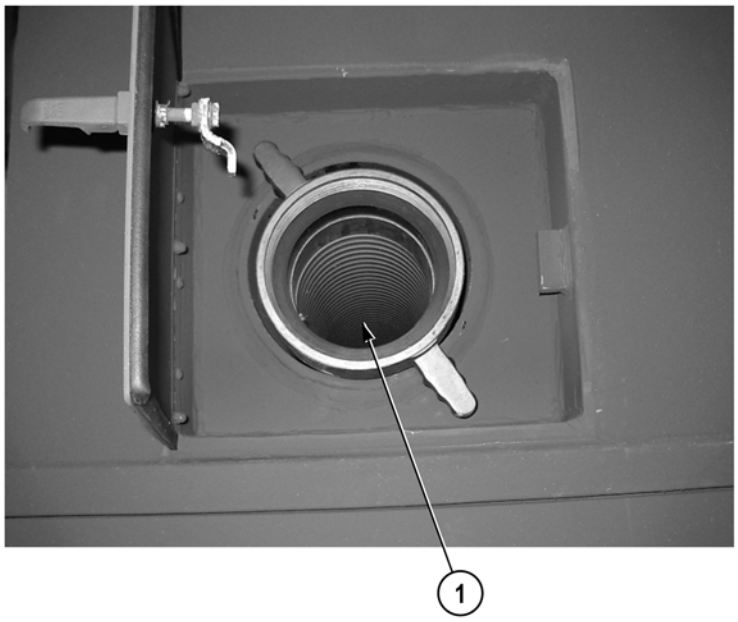


Table 11. Load Plan (Stowage Compartments R1 and R2).

NO.	ITEM	QTY.
1	Hard Suction Hose 5 in. DIA x 15 ft. long	2

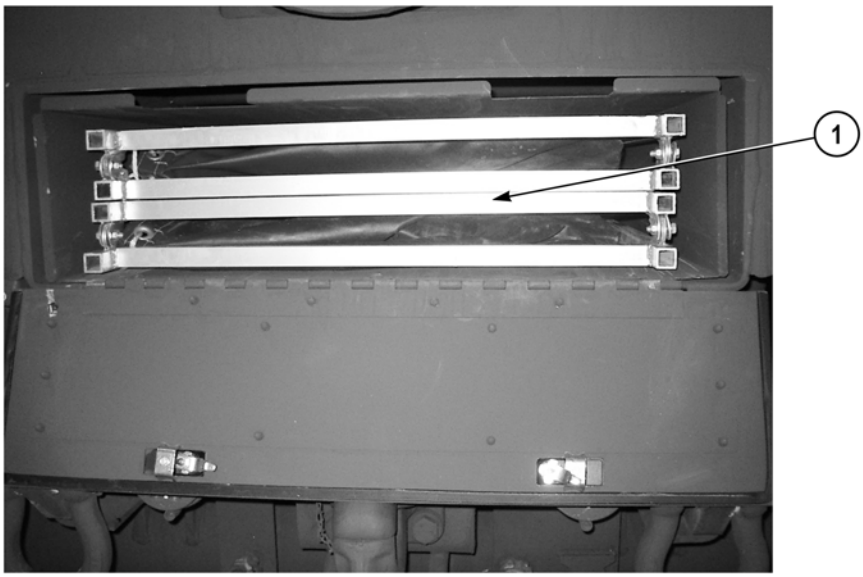


Table 12. Load Plan (Stowage Compartment R3).

NO.	ITEM	QTY.
1	2500 Gallon Portable Water Tank	1

(LADDER SHOWN REMOVED FROM MOUNTING BRACKETS FOR CLARITY)

Table 13. Load Plan (Stowage Compartment T1).

NO.	ITEM	QTY.
1	HEMTT Ladder	1

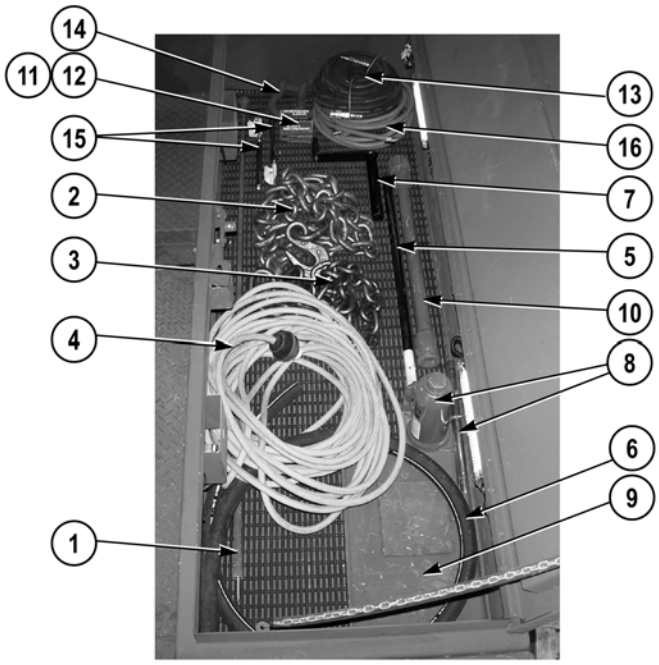


Table 14. Load Plan (Stowage Compartment T2).

NO.	ITEM	QTY.
1	Antenna	1
2	Chain Assy. (14 ft.)	1
3	Chain, Utility (7 ft.)	1
4	Extension Cord, Shoreline (75 ft.)	1
5	Extension Handle	1
6	Foam Tank Drain Hose	1
7	Hose Reel Handle	1
8	Hydraulic Jack and Handle	1
9	Jack Plate	1
10	Lug Nut Wrench (2 pcs.)	1
11	Padlock w/Chain	4
12	Padlock w/o Chain	1
13	Pump Blow out Hose	1
14	Shackle Anchor	1
15	Tire Gauge Inflator/Deflator	2
16	Tire Inflation Hose Assembly	2

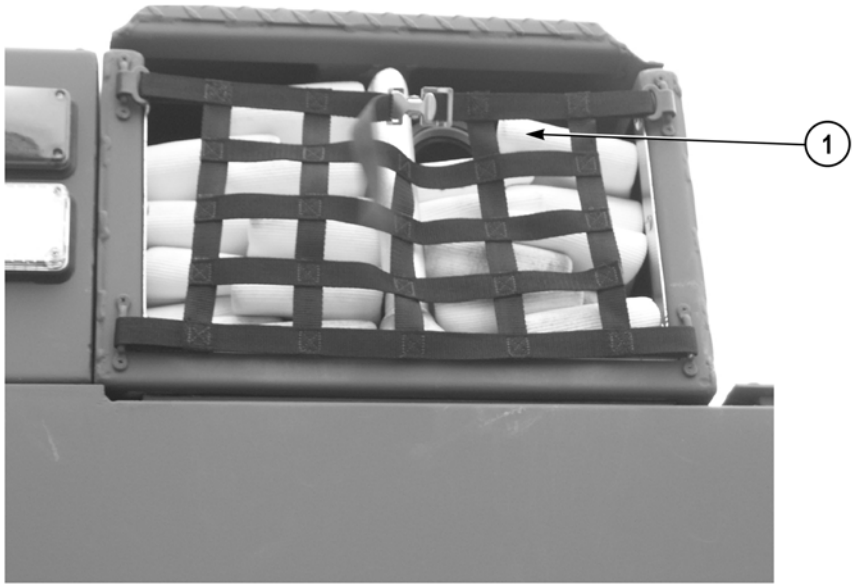


Table 15. Load Plan (Stowage Compartment T4).

NO.	ITEM	QTY.
1	Soft Discharge Hose - 3 in. x 50 ft., Double Jacketed NFPA Hose, (2-1/2 in. Connections)	8

END OF WORK PACKAGE

CHAPTER 3

TROUBLESHOOTING PROCEDURES

OPERATOR AND FIELD LEVEL MAINTENANCE

TROUBLESHOOTING INSTRUCTIONS INTRODUCTION

This chapter contains Operator and Field Level troubleshooting procedures to diagnose and correct the most common malfunctions of the HEWATT. Refer to TM 9-2320-315-14&P for M985 series vehicle troubleshooting.

Each troubleshooting procedure in this manual lists a malfunction, followed by tests or inspections, and the corrective actions needed to correct the malfunction. This manual cannot list all malfunctions that may occur. Nor can it list all test, inspections, and corrective actions needed to correct the malfunctions. If a malfunction is not listed, or if listed corrective actions do not correct the malfunction, notify your Supervisor. See WP 0041 for an index of Operator Level troubleshooting procedures, and WP 0042 for Field Level troubleshooting procedures.

Before beginning any troubleshooting procedure, read and understand the operating procedures listed in Chapter 2 of this manual. Perform all applicable Preventive Maintenance Checks and Services (PMCS) procedures for the M985 series vehicle (TM 9-2320-315-14&P) and the M1158 series vehicle (WP 0125). Ensure all system setup procedures are completed.

All steps in these troubleshooting procedures must be performed in the order listed, to ensure all system interlocks are in the correct position for system operations.

a. Resistance Checks.

⚠ CAUTION

Use proper sized test leads and ensure care is used when checking for resistance, continuity, or voltage at connectors or damage to equipment may result.

1. Set the multimeter function/range switch to the desired ohm position. If the magnitude of the resistance is not known, set the switch to the highest range, then reduce range until a satisfactory reading is obtained.

NOTE

Some meters show “l+m”, or simply “l” when function/range switch is set to an ohm position.

2. Connect red test lead to volt-ohm input connector and black lead to COM connector on multimeter. When the test leads are separated or measuring out-of-range resistance, the digital display will indicate “OL” (Over Load).
3. If the circuit being measured is connected to power, turn engine start switch OFF (TM 9-2320-279-10).
4. Connect test leads to the circuit being measured. When measuring high resistance be careful not to contact adjacent point, even if they are insulated. Some insulators have a relatively low insulation resistance which can effect the resulting measurement.
5. Read the resistance value on the digital display.
6. If your meter does not work in this manner, learn how it operates before performing troubleshooting.

b. Continuity Checks.

1. Set the multimeter function/range switch to any ohm range.

NOTE

Some meters show “l+m”, or simply “l” when function/range switch is set to an ohm position.

2. Connect red test lead to volt-ohm input connector and black lead to COM connector on multimeter. When the test leads are separated or measuring out-of-range resistance, the digital display will indicate “OL” (Over Load).
3. If the circuit being measured is connected to power, turn engine start switch OFF (TM 9-2320-279-10).
4. Connect test lead to one end of the wire or circuit to be measured. Use the other test lead to trace the circuit being measured. When continuity is established, an ohm symbol will appear in the upper left corner of the digital display. If contact with the circuit is maintained long enough (about 1/4 second), the “OL” display will disappear and the resistance value if the circuit will be displayed. A resistance value of 200 ohms or less indicates continuity is being measured.
5. If your multimeter does not work in this manner, learn how it operates before performing troubleshooting.

c. Voltage Checks.

The HEWATT is equipped with 24 VDC circuits. However, a valid reading may vary from 22 to 28 VDC, depending on the charge on the batteries. When the batteries are fully charged, 25.2 VDC can be measured on an open 24 VDC circuit, and 29 VDC can be measured when the engine is running at 1000 rpm.

1. Set the multimeter function/range switch to the desired volts position. If the magnitude of the voltage is not known, set the switch to the highest range, then reduce range until a satisfactory reading is obtained. If a DC-AC switch is present, ensure it is set to the DC position
2. Connect red test lead to volt-ohm input connector and black lead to COM connector on multimeter.
3. Connect the tests leads to the circuit being measured. Connecting the red lead to the positive (+) connection and the black test lead to the negative (-) or ground connection.
4. Turn on switches as indicated in test procedure, to apply power to circuit being measured.
5. Read the voltage value on the digital display.
6. If your meter does not work in this manner, learn how it operates before performing troubleshooting.

d. General Wire Testing and Repair.

Troubleshooting for the HEWATT electrical system isolates malfunctions down to specific faulty components, using resistance, continuity, and voltage checks as noted above. When the troubleshooting isolates the malfunction to a faulty wire, the wire harness may be repaired or some cases replaced at Field Level Maintenance. If the wire harness cannot be repaired or replaced at Field Level Maintenance, notify your Supervisor.

Wire repair at Field Level Maintenance is limited to splicing and taping the faulty wire. Refer to TM 9-2320-315-14&P for wire harness repair procedures.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

OPERATOR LEVEL TROUBLESHOOTING FAULT INDEX

Table 1. Operator Level Troubleshooting Fault Index.

Troubleshooting Procedure	Work Package
24-Volt Battery Charger Does Not Operate	0043
Check For Open Compartment Doors When Light Is On Indicator Flashes	0044
Streamlight Battery Charger(s) Does Not Charge Batteries	0045
Foam System Does Not Operate	0046
Pressure Governor Control Displays WARNING! or CAUTION!	0047
Pressure Governor Controls Do Not Operate	0048
Pump Does Not Prime	0049
Pump Loses Prime or Pressure Governor Displays LOW SUPPLY or PRESET NOT MET, and Pump Returns to Idle Mode	0050
Drain Valves or Main Inlet Cap Leaking During Pumping Operations	0051
Handheld Radio Battery Charger(s) Does Not Charge Batteries	0052
Scene Lights, Step Lights, Cab Dome Lights, Clearance Lights, and Stowage Compartment Lights or Warning Lights Do Not Operate	0053
Discharges Have Abnormal Water Stream	0054

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FIELD LEVEL TROUBLESHOOTING FAULT INDEX

Table 1. Field Level Troubleshooting Fault Index.

Troubleshooting Procedure	Work Package
FIRE PUMP SYSTEM	
Hydraulic Heat Exchanger Fan(s) Do Not Operate	0055
FOAM PROPORTIONER SYSTEM	
Foam Not Delivered From All Systems (Bumper Turret, Under Truck Nozzles, and Manual Metering Controls) or System Does Not Shut Off	0056
Foam Not Delivered From Bumper Turret	0057
Foam Not Delivered From Under Truck Nozzles	0058
Foam Not Delivered When Manual Metering Control Is Operated	0059
Foam System Cannot Be Flushed	0060
Foam Tank Level Indicator Gauge Does Not Operate Properly	0061
WATER TANK ASSEMBLY	
Bumper Turret Does Not Operate Properly When Selected	0062
Direct Tank Fill Valve Does Not Operate Properly (Auto or Manual Mode)	0063
Driver Side Auxiliary Inlet Valve Does Not Operate Properly	0064
Hose Reel Rewind Control Does Not Operate	0065
Hose Reel Discharge Valve Does Not Operate When Selected	0066
No. 1 Driver Side Discharge Valve Does Not Operate Properly	0067
No. 2 Passenger Side Discharge Valve Does Not Operate Properly	0068
Passenger Side Auxiliary Inlet Valve Does Not Operate Properly	0069
Pump Cooler Valve Does Not Operate Properly	0070
Pressure Governor Controls Do Not Operate Properly	0071
Pump Priming System Does Not Operate Properly	0072
Tank Fill & Re-Circulating Line Valve Does Not Operate Properly	0073
Tank-To-Pump Valve Does Not Operate Properly	0074
Under Truck Nozzles Do Not Operate When Selected	0075
Water Pump Is Noisy	0076
Water PUMP PTO Does Not Engage When Selected	0077
Water Tank Drain Valve Does Not Operate When Selected	0078

Table 1. Field Level Troubleshooting Fault Index. (Continued)

Troubleshooting Procedure	Work Package
Water Tank Level Indicator Gauge Does Not Operate Properly	0079
Water Pump Input Pressure Low or Pressure Governor Displays CAVITATION, LOW SUPPLY Pressure, and Pump Returns to Idle Mode	0080
Water Pump Is Overheating	0081
Water Pump Output Pressure Low or Pressure Governor Displays PRESET NOT MET, and Pump Returns to Idle Mode	0082
Windshield Deluge System Does Not Operate Properly	0083
INSTRUMENT HOUSING ASSEMBLY	
Cab Switch Backlighting Does Not Operate	0084
Direct Tank Fill AUTO Indicator Does Not Illuminate (Pump Operator’s Panel)	0085
Direct Tank Fill OPEN Indicator Does Not Illuminate (Pump Operator’s Panel)	0086
Check For Open Compartment Doors When Light Is On Indicator Does Not Operate Properly	0087
FOAM FLUSH Indicator Does Not Illuminate (Pump Operator's Panel)	0088
FOAM SYSTEM Indicator Does Not Illuminate (Cab)	0089
FOAM SYSTEM Indicator Does Not Illuminate (Pump Operator's Panel)	0090
Hose REEL DISCHARGE Valve Indicator Does Not Illuminate (Pump Operator's Panel)	0091
PUMP COOLER Indicator Does Not Illuminate (Cab)	0092
PUMP COOLER Indicator Does Not Illuminate (Pump Operator's Panel)	0093
PUMP PTO ENGAGED Indicator Does Not Illuminate (Cab)	0094
PUMP HOT Audio Alarm or Indicator Does Not Operate Properly (Pump Operator's Panel)	0095
WATER TANK DRAIN Indicator Does Not Illuminate (Pump Operator's Panel)	0096
TANK TO PUMP Indicator Does Not Illuminate (Cab)	0097
TANK TO PUMP Indicator Does Not Illuminate (Pump Operator's Panel)	0098
UNDER TRUCK NOZZLES Indicator Does Not Illuminate (CAB)	0099
WARNING LIGHT ASSEMBLY	
Warning Lights (All) Do Not Operate	0100
Warning Lights (Front and Rear Lower) Do Not Operate	0101
Warning Lights (Overhead Beacon) Do Not Operate	0102
Warning Lights (Cab Roof Lightbar) Do Not Operate	0103
Warning Lights (Side) Do Not Operate	0104
Warning Lights (Upper Rear) Do Not Operate	0105

Table 1. Field Level Troubleshooting Fault Index. (Continued)

Troubleshooting Procedure	Work Package
SPOTLIGHTS	
Driver Side Scene Light(s) Does Not Operate	0106
Step (Hose Bed) Light(s) Does Not Operate	0107
Passenger Side Scene Light(s) Does Not Operate	0108
Rear Scene Light(s) Does Not Operate	0109
DOME AND ENGINE LIGHT ASSEMBLY	
Cab Dome Light(s) Does Not Operate	0110
12-Volt Handheld Radio Charger(s) Does Not Operate	0111
12-Volt Streamlight Charger(s) Does Not Operate	0112
24-Volt Battery Charger Does Not Operate Properly	0113
Clearance and/or Directional Light(s) Does Not Operate	0114
Driver Side Stowage Compartment Striplight(s) Does Not Operate	0115
Two-Way Radio Does Not Operate Properly	0116
Intercom and Headsets Do Not Operate Properly	0117
Passenger Side Stowage Compartment Striplight(s) Does Not Operate	0118
Pump House or Pump Operator’s Panel Striplight(s) Does Not Operate	0119
Rear Step Buzzer Audio Alarm Does Not Operate	0120
SINCGARS Do Not Operate Properly	0121
Siren Does Not Operate Properly	0122
Shoreline Inlet Receptacle Does Not Operate Properly	0123
HEATER, VEHICLE COMPARTMENT	
Pump House Heater Does Not Operate Properly	0124

END OF WORK PACKAGE

OPERATOR MAINTENANCE

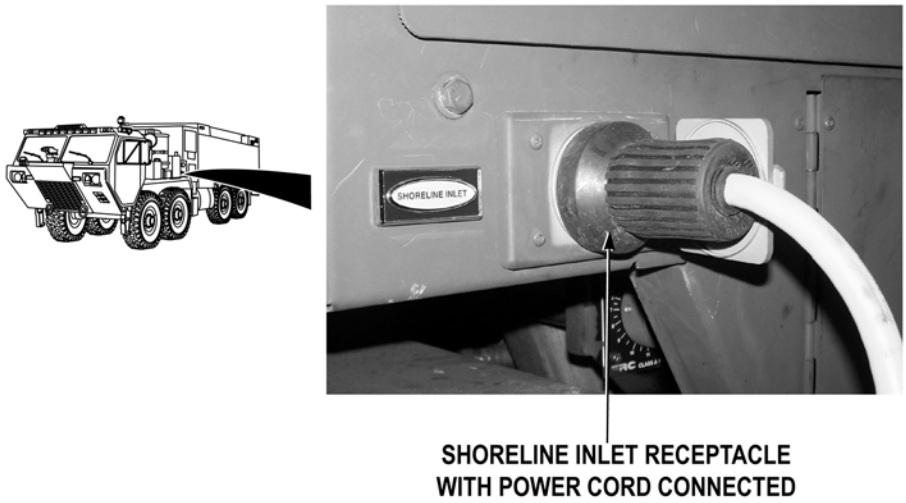
24-VOLT BATTERY CHARGER DOES NOT OPERATE

INITIAL SETUP:

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

24-VOLT BATTERY CHARGER DOES NOT OPERATE

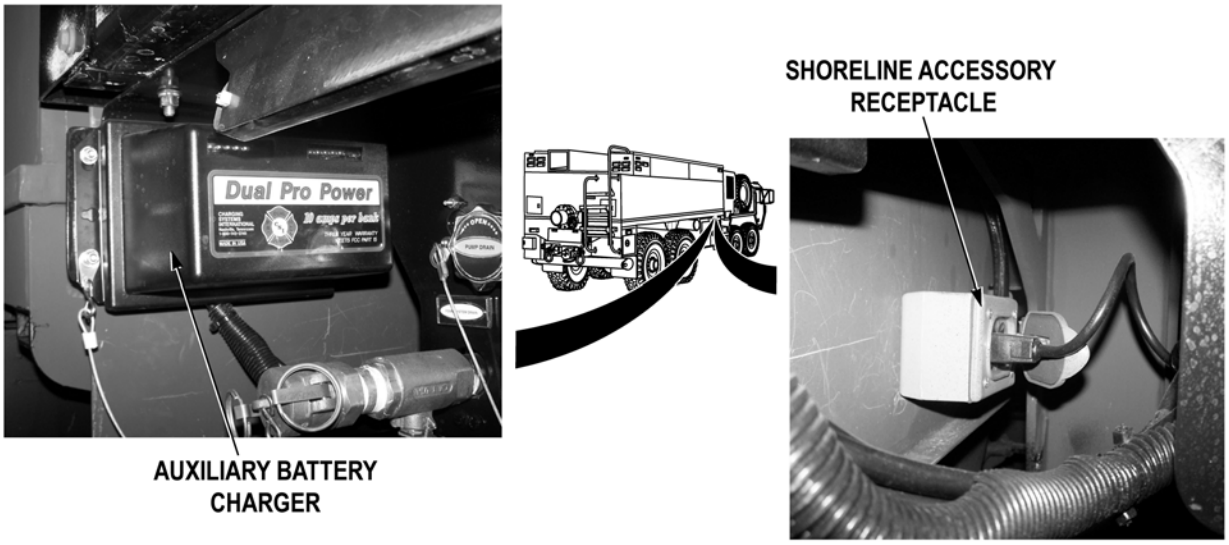


SHORELINE INLET RECEPTACLE
WITH POWER CORD CONNECTED

Step 1. Check if power cord is connected to SHORELINE INLET receptacle and power source receptacle.

If power cord is not connected, connect power cord.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Check if battery charger power cord is plugged into shoreline accessory receptacle.

a. If battery charger power cord is not plugged into shoreline accessory receptacle, plug power cord into receptacle.

b. If battery charger power cord is plugged into shoreline accessory receptacle, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

CHECK FOR OPEN COMPARTMENT DOORS WHEN LIGHT IS ON INDICATOR FLASHES

INITIAL SETUP:

References	Equipment Conditions
WP 0008	Wheels chocked (TM 9-2320-279-10)

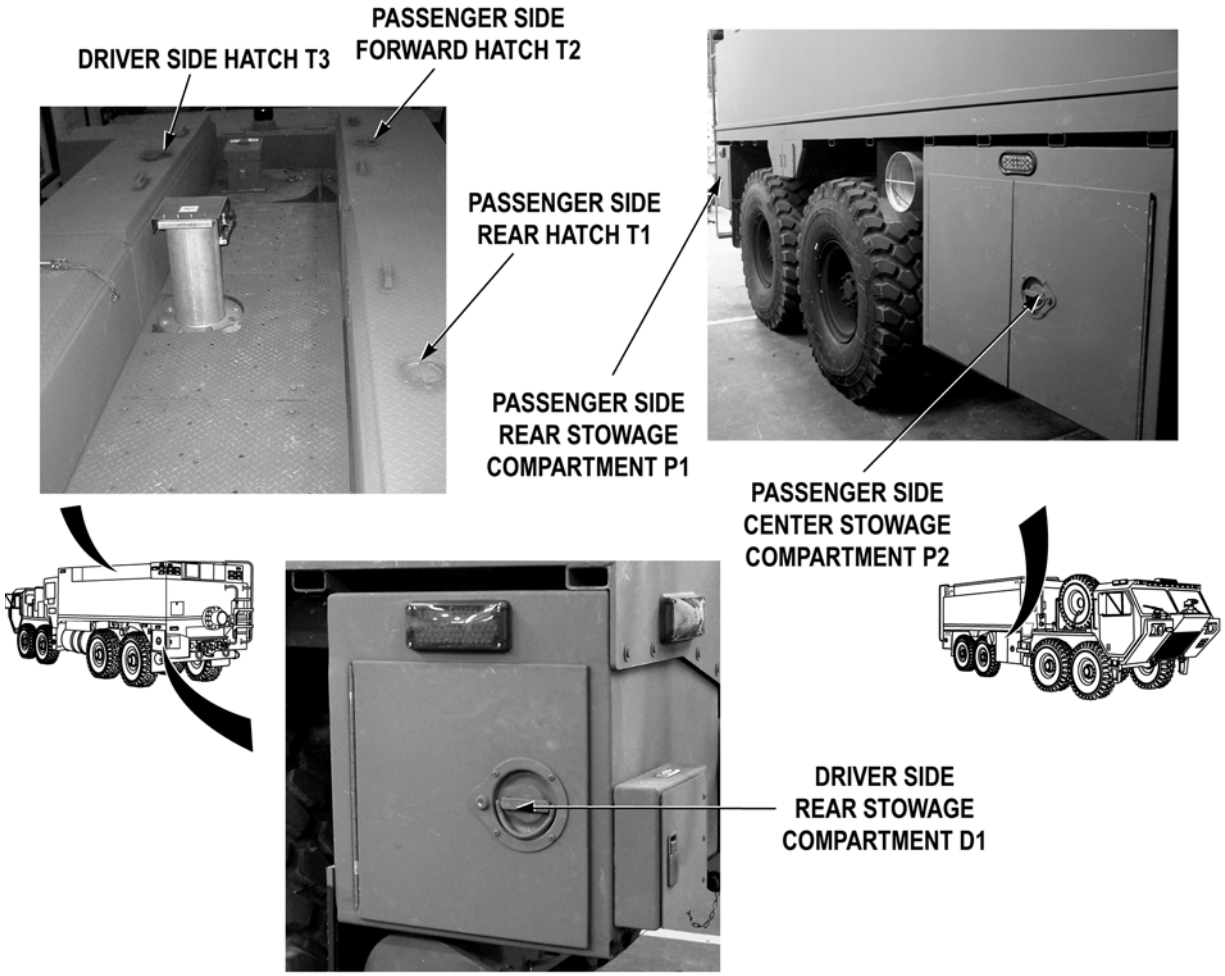
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

CHECK FOR OPEN COMPARTMENT DOORS WHEN LIGHT IS ON INDICATOR FLASHES

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Check if all stowage compartment doors and hatches are closed (WP 0008).

a. If any stowage compartment doors or hatches are open, close them (WP 0008).

b. If all stowage compartment doors and hatches are closed, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

STREAMLIGHT BATTERY CHARGER(S) DOES NOT CHARGE BATTERIES

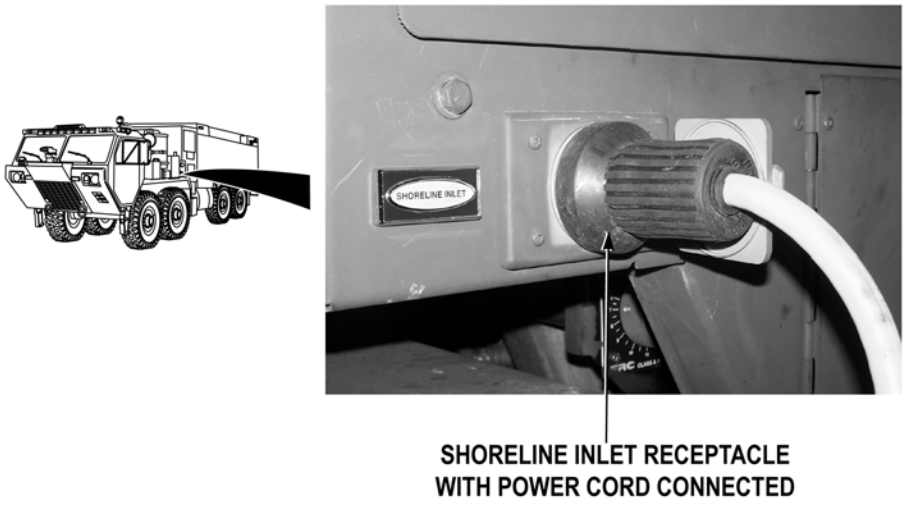
INITIAL SETUP:

References
WP 0007
WP 0029
WP 0043
WP 0260

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

STREAMLIGHT BATTERY CHARGER(S) DOES NOT CHARGE BATTERIES



SHORELINE INLET RECEPTACLE
WITH POWER CORD CONNECTED

Step 1. Check if shoreline inlet power cord is connected (WP 0029).

If shoreline inlet power cord is connected, troubleshoot 24-Volt Battery Charger Does Not Operate (WP 0043).

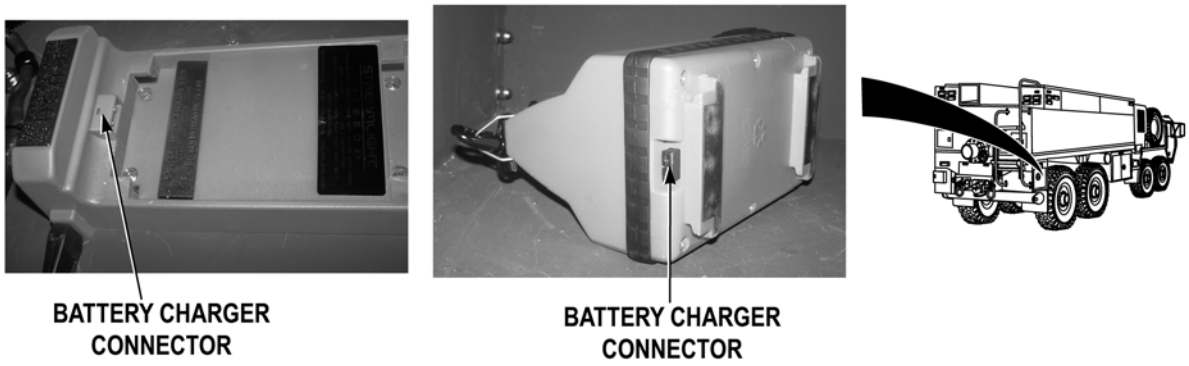
Step 2. Check if battery disconnect switch is in on position (WP 0007).

If battery disconnect switch is in off position, push battery disconnect switch to on position (WP 0007).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 3. Check if battery charger power cord is properly installed in streamlight battery charger.

If battery charger power cord is not properly installed in battery charger, reinstall power cord (WP 0260).



Step 4. Check if streamlight is fully seated in battery charger.

a. If streamlight is not fully seated in battery charger, reseat streamlight.

b. If streamlight is fully seated in battery charger, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FOAM SYSTEM DOES NOT OPERATE

INITIAL SETUP:

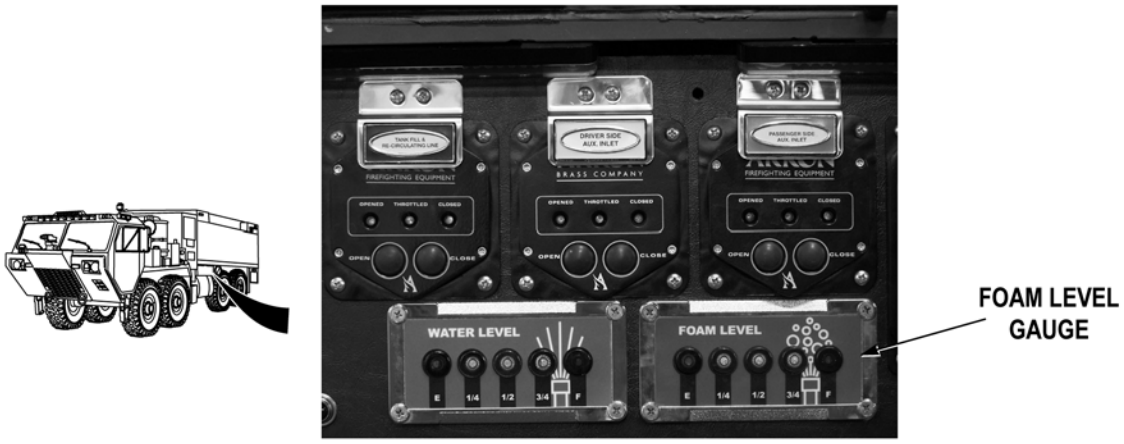
References
WP 0004
WP 0010
WP 0018
WP 0021
WP 0023
WP 0026
WP 0027
WP 0180
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

FOAM SYSTEM DOES NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Before operating foam system, personnel must familiarize themselves with all procedures and instructions regarding water pump, discharge devices, and foam making devices. Failure to comply may result in injury to personnel and/or damage to equipment.

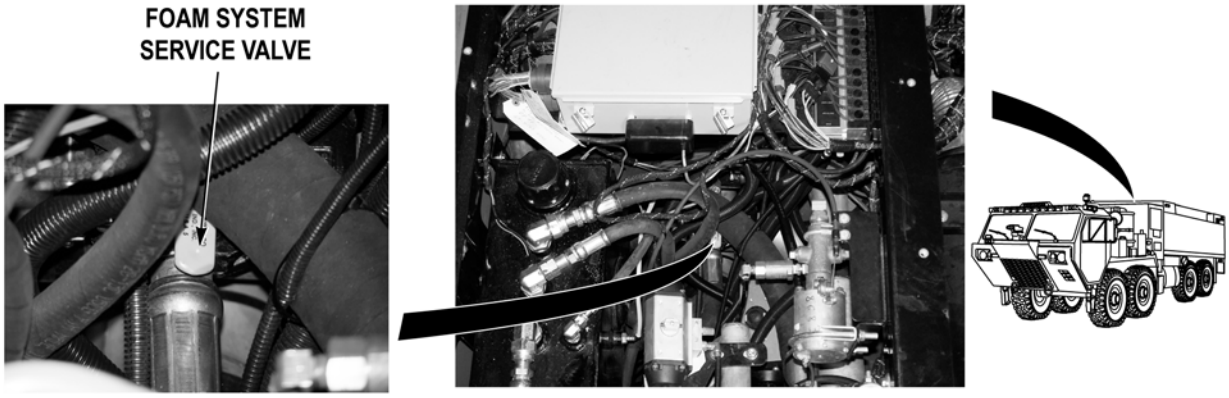
CAUTION

Do not mix different types or manufacturer's brands of foam agent in foam cell or piping. Mixing of different foam agents (either type or manufacturer) may cause deterioration of foam agent, improper proportioning, and poor performance in a fire situation. Mixing of Class A and different types of foam agents may result in a chemical reaction which can create globules, which can clog orifices and cause system failure.

Step 1. Open pump operator's panel (WP 0010). Check pump operator's panel FOAM LEVEL gauge (WP 0004).

If foam level gauge indicates E (empty) (WP 0004), fill foam tank (WP 0021).

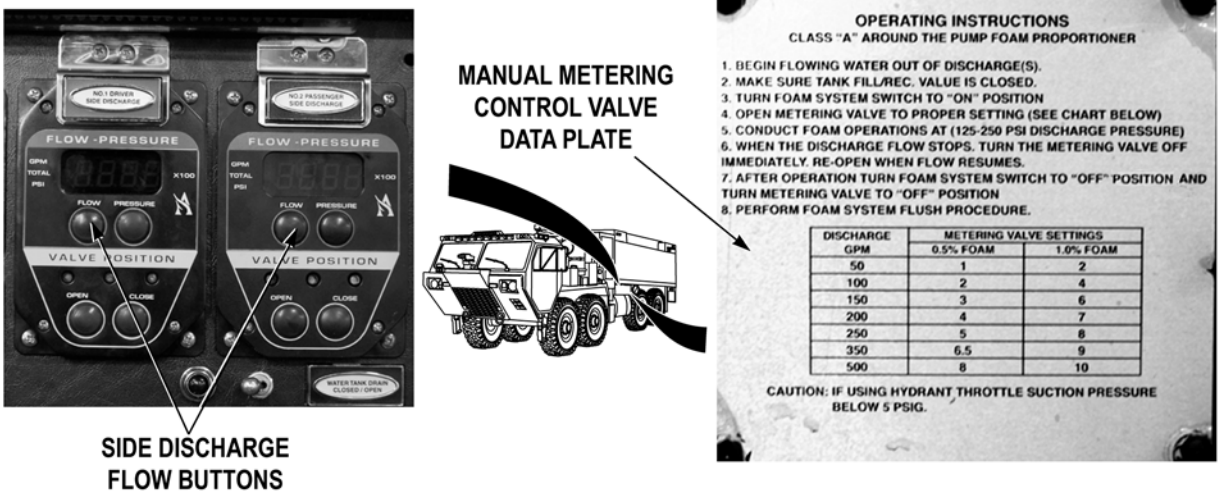
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Open pump house access panel K (WP 0341). Check if foam system service valve is in open position (WP 0004).

If foam system service valve is not in open position, put valve to open position (WP 0004).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Ensure PTO area is clear of personnel and obstructions before engaging PUMP PTO switch. Failure to comply may result in injury or death to personnel and/or damage to equipment.

NOTE

Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.

Step 3. Start engine (TM 9-2320-279-10). Set up system to pump from onboard water tank (WP 0018). Turn on foam system (WP 0023). When discharging from NO.1 DRIVER SIDE DISCHARGE or NO. 2 PASSENGER SIDE DISCHARGE, press FLOW button on valve control. Record GPM rate, using settings from manual metering control valve data plate set manual metering valve to match discharge rate of flow. Operate bumper turret (WP 0026), under truck nozzles (WP 0027), or side discharge. Check if foam is delivered when system is operated.

a. If foam is delivered, problem has been corrected.

b. If foam is not delivered, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PRESSURE GOVERNOR CONTROL DISPLAYS WARNING! OR CAUTION!

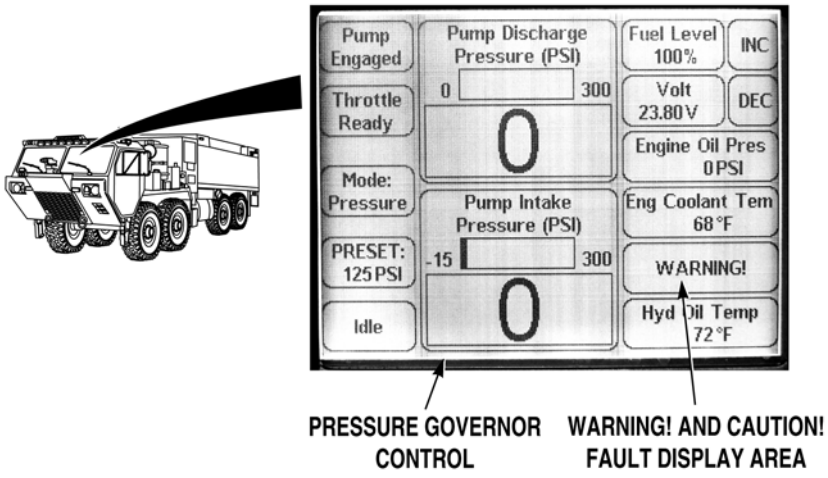
INITIAL SETUP:

References
TM 9-2320-315-14&P
WP 0004
WP 0008
WP 0016
WP 0143

Equipment Conditions
Parking brake applied (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

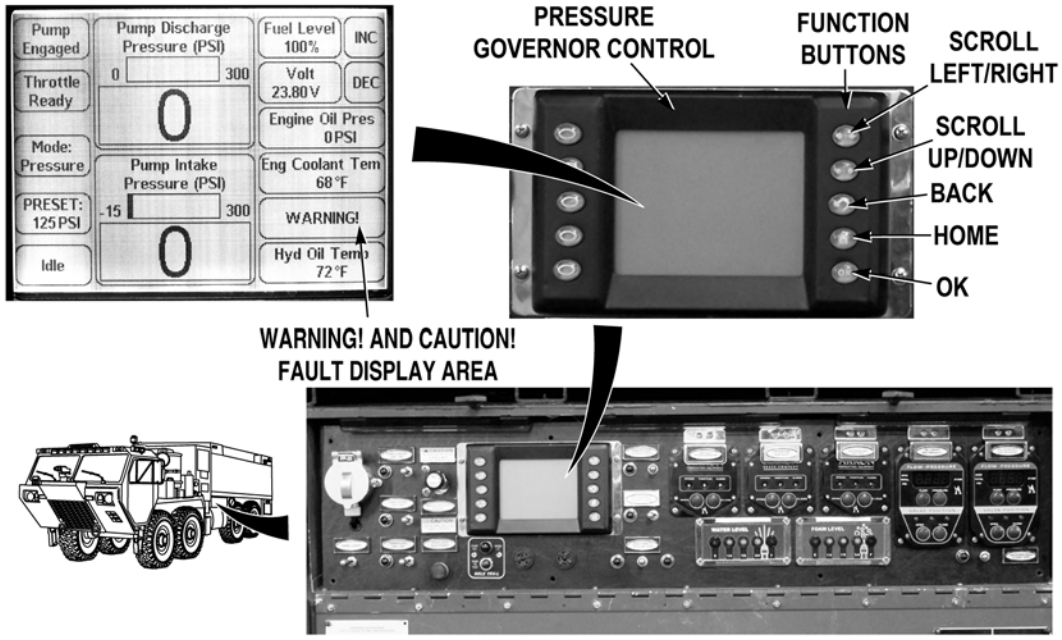
PRESSURE GOVERNOR CONTROL DISPLAYS WARNING! OR CAUTION!



NOTE

- System operations may be degraded, when pressure governor WARNING! and CAUTION! are active. All system WARNING! and CAUTION! should be cleared before operations are continued.
- Some system warnings will bring pump operations to idle. If pump operations are brought to idle, do not attempt to restart operations until all WARNING! and CAUTION! are cleared.
- WARNING! and CAUTION! indicator will be displayed until conditions are cleared.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. If pressure governor displays WARNING! indicator, perform the following to display warnings (WP 0016).

a. Press home button to display home diagnostic screen (WP 0004).

b. Press OK button to acknowledge warning and view details of fault (WP 0004).

c. Record warning.

d. Press back button to view home diagnostic screen.

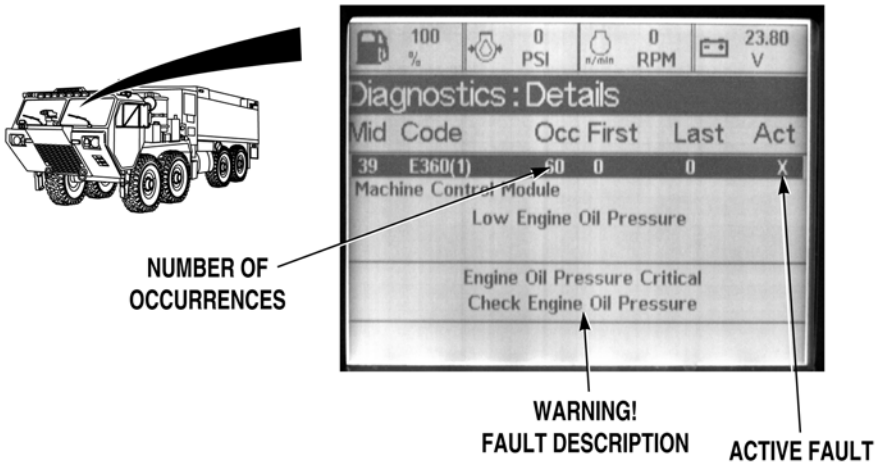
e. If more than one WARNING! fault has occurred, press scroll up/down button to select next occurring WARNING! fault.

f. Press OK button to acknowledge warning and view details of fault.

g. If WARNING! is displayed, record warning.

h. Repeat Steps (d) through (g) above, until operator's screen is displayed.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

- Active WARNING! and CAUTION! are displayed on home diagnostic screen with an “X” in ACT column.
- Inactive WARNING! and CAUTION! are displayed on a home diagnostic screen with a “— ” in ACT column.
- Engine oil pressure will be displayed if truck is not running.

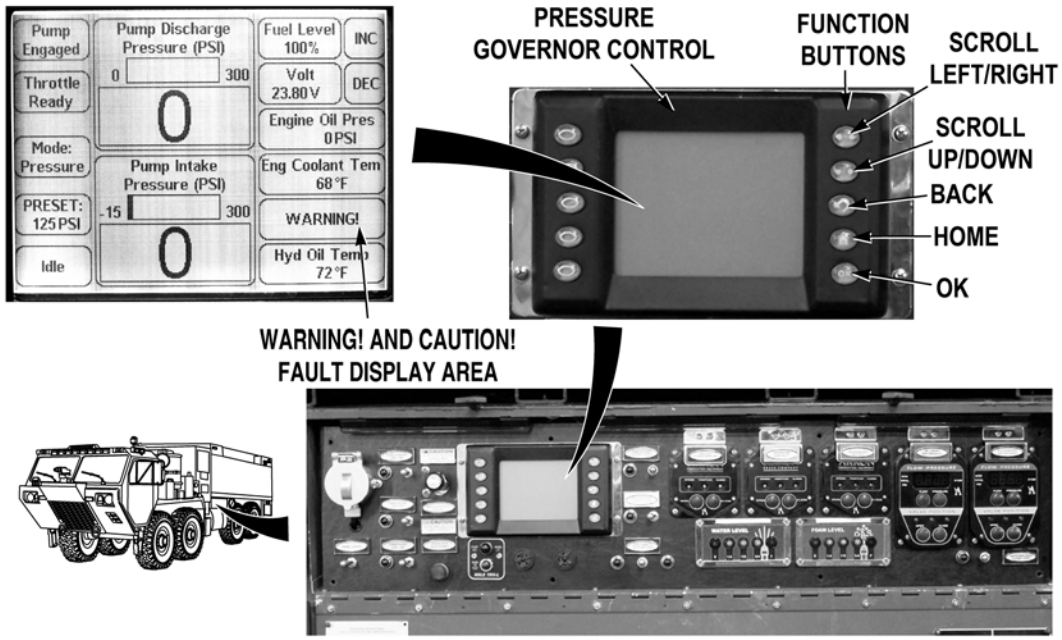
i. If Engine Oil Pressure Critical warning is displayed, troubleshoot Low Oil Pressure Gauge Indication (TM 9-2320-315-14&P).

j. If Engine Water Temp Is At A Critical Level warning is displayed, troubleshoot Engine Overheats (TM 9-2320-315-14&P).

k. If Fuel Level Critical warning is displayed, fill fuel tank (TM 9-2320-279-10).

l. If any other warnings are displayed, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. If pressure governor displays CAUTION! indicator, perform the following to display cautions (WP 0016).

a. Press home button to display home diagnostic screen (WP 0004).

b. Press OK button to acknowledge caution and view details of fault (WP 0004).

c. Record caution.

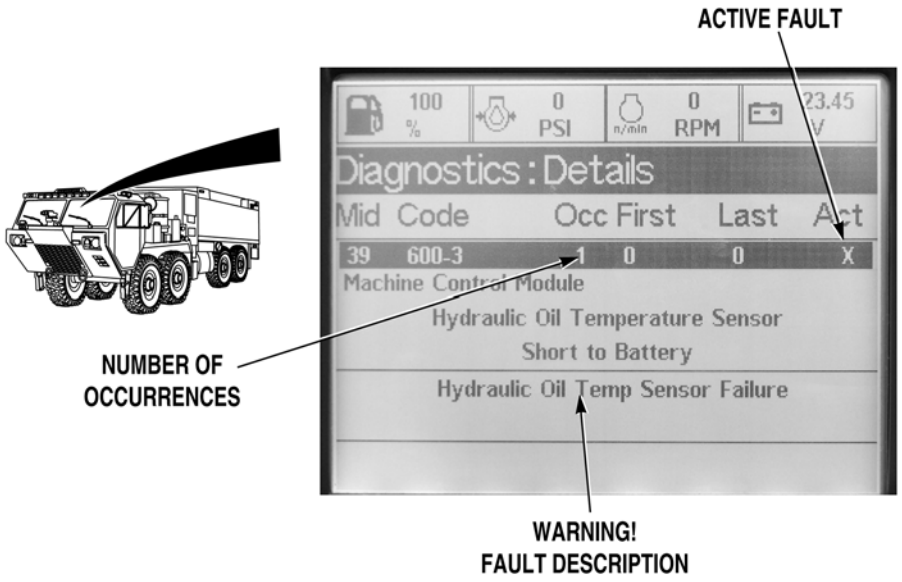
d. Press back button to view home diagnostic screen.

e. If more than one CAUTION! fault has occurred, press scroll up/down button to select next occurring CAUTION! fault.

f. Press OK button to acknowledge caution and view details of fault.

g. If CAUTION! is displayed, record caution.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



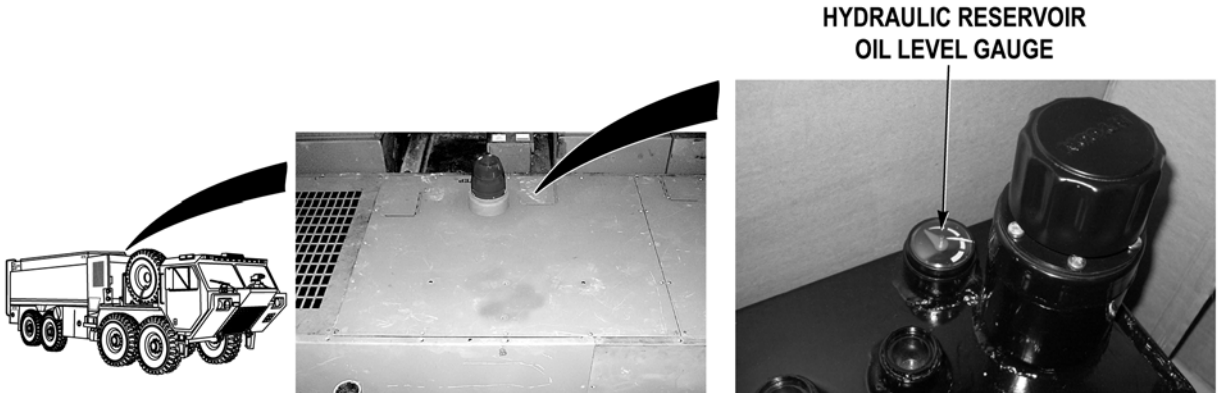
h. Repeat Steps (d) through (g) above until operator's screen is displayed.

Step 3. After following diagnostic procedures, check if Hydraulic Oil Temp Critical or any other cautions are displayed.

a. If Hydraulic Oil Temp Critical is displayed, go to Step 4.

b. If any other cautions are displayed, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

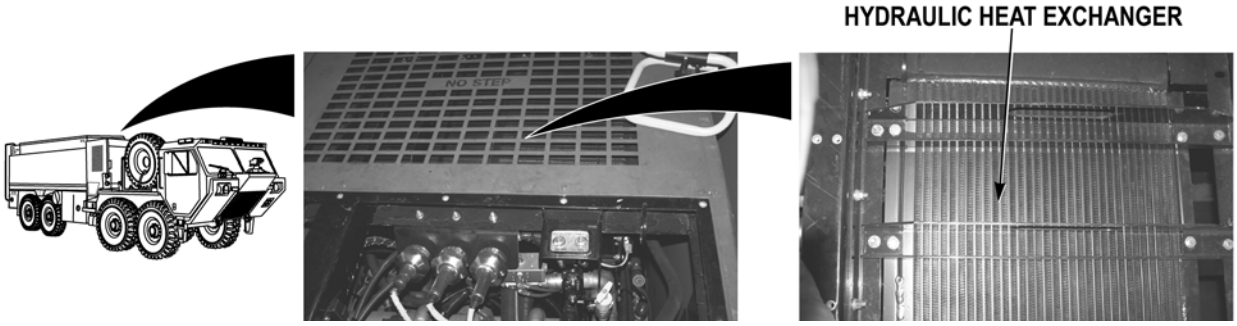


NOTE

Hydraulic reservoir oil level must be checked with vehicle parked on level ground.

Step 4. Open pump house panel K access door (WP 0008). Check hydraulic reservoir oil level at normal operating temperature.

If hydraulic reservoir oil level is low, fill to proper level (WP 0143).



Step 5. Check hydraulic heat exchanger for blockage.

a. If hydraulic heat exchanger is blocked, remove blockage.

b. If hydraulic heat exchanger is not blocked, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PRESSURE GOVERNOR CONTROLS DO NOT OPERATE

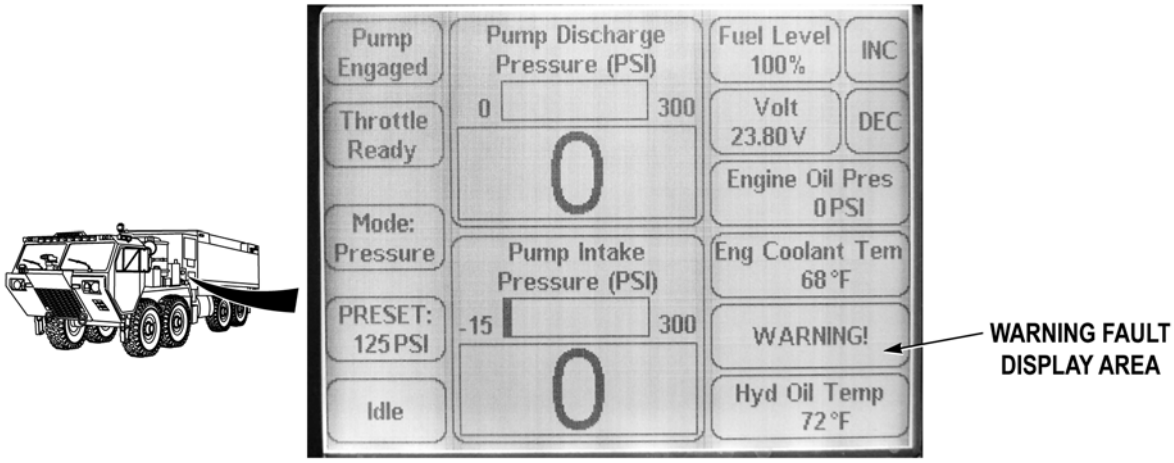
INITIAL SETUP:

References
WP 0004
WP 0016
WP 0047

Equipment Conditions
Parking brake applied (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PRESSURE GOVERNOR CONTROLS DO NOT OPERATE



NOTE

Some system warnings will shut down pump operations. If pump operations are shut down, do not attempt to restart operations until all WARNINGS! and CAUTIONS! are cleared.

Step 1. Check if pressure governor control displays a WARNING! fault (WP 0016).

If pressure governor displays a WARNING! fault, troubleshoot Pressure Governor Control Displays WARNING! or CAUTION! (WP 0047).

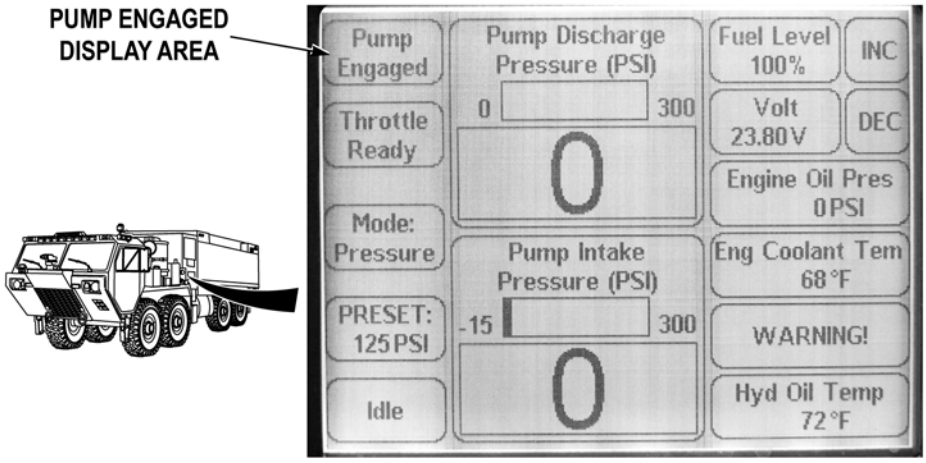
Step 2. If operating pressure governor control from cab, check if pump operator's panel pressure governor control is active (WP 0016).

If active, disable pump operator's panel pressure governor control (WP 0016).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

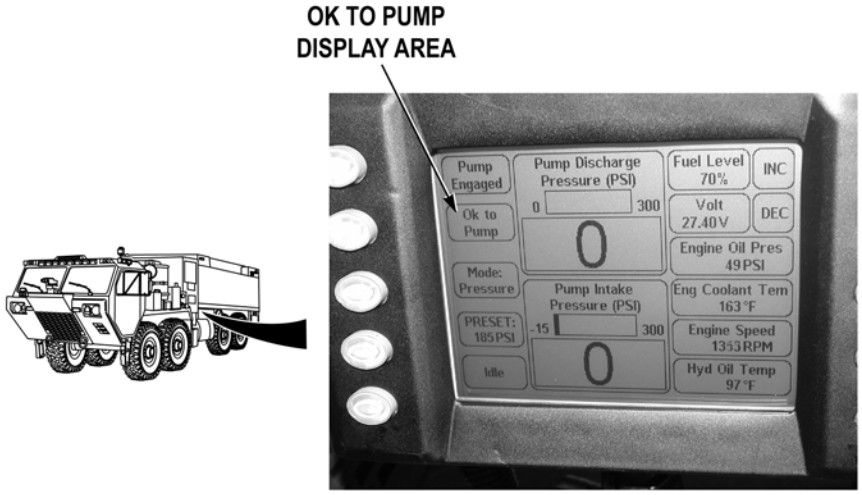
Step 3. If operating pressure governor control from pump operator's panel, check if cab pressure governor control is active (WP 0016).

If active, disable cab pressure governor control (WP 0016).



Step 4. Check if pressure governor control displays Pump Engaged (WP 0016).

If PUMP ENGAGED indicator is not displayed, go to Step 6.

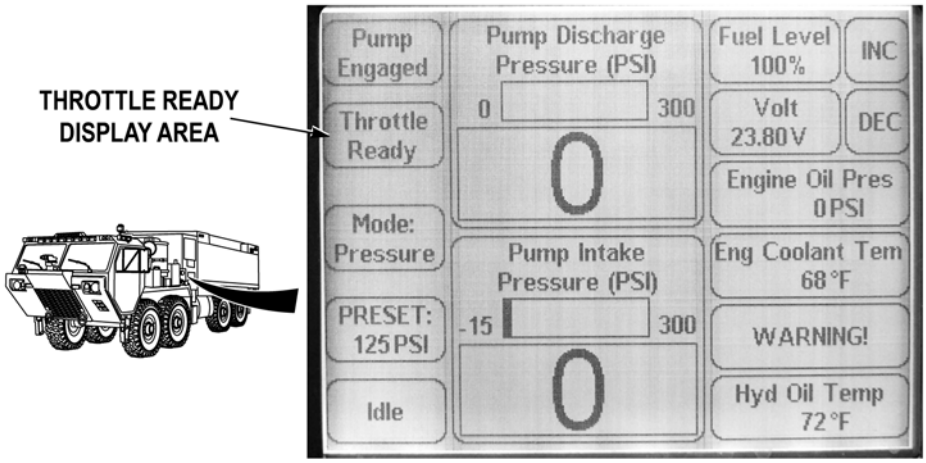


Step 5. If operating from cab, check if pressure governor control displays Ok to Pump or Ok to Pump and Roll (WP 0016).

a. If Ok to Pump or Ok to Pump and Roll is not displayed, go to Step 8.

b. If Ok to Pump or Ok to Pump and Roll is displayed, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. If operating from pump operator's panel, check if pressure governor control displays Throttle Ready (WP 0016).

If Throttle Ready is not displayed, go to Step 8.

Step 7. Check if PUMP PTO switch is in on position (WP 0004).

a. If PUMP PTO switch is not in on position, put PUMP PTO switch to on position (WP 0004).

b. If PUMP PTO switch is in on position, notify Supervisor.

Step 8. Check if pressure governor control displays High Idle Not Engaged (WP 0016).

If High Idle Not Engaged indicator is displayed, go to Step 11.

Step 9. Check if transmission selector is in N neutral (TM 9-2320-279-10).

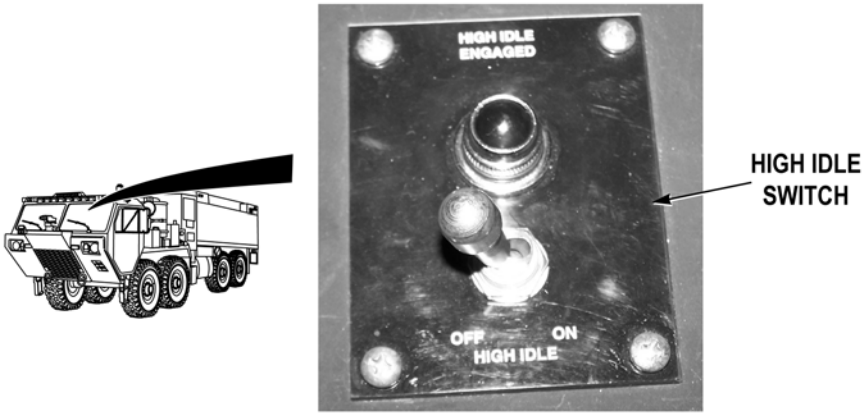
If transmission selector is not in N neutral, select N neutral (TM 9-2320-279-10).

Step 10. Check if parking brakes are applied (TM 9-2320-279-10).

a. If parking brakes are not applied, apply parking brakes (TM 9-2320-279-10).

b. If parking brakes are applied, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Check if HIGH IDLE switch is in ON position (TM 9-2320-279-10).

a. If HIGH IDLE switch is not in ON position, put HIGH IDLE switch to ON position (TM 9-2320-279-10).

b. If HIGH IDLE switch is in ON position, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR LEVEL MAINTENANCE

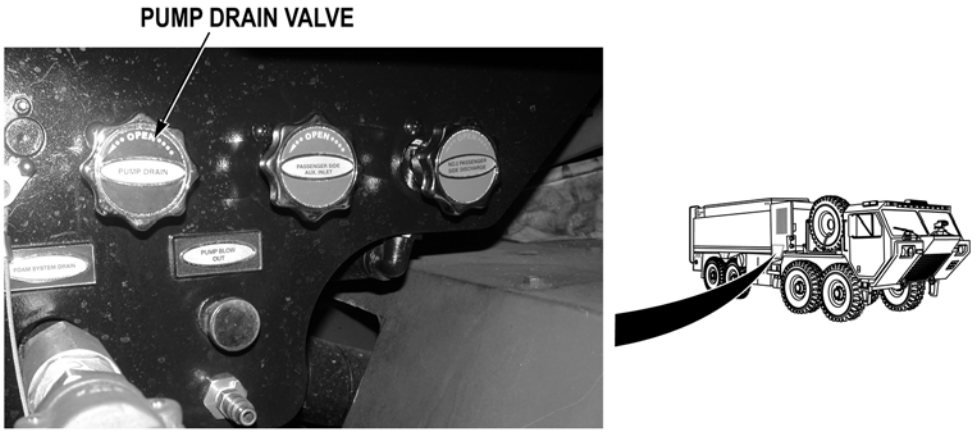
PUMP DOES NOT PRIME

References
WP 0004
WP 0014
WP 0017
WP 0018
WP 0019
WP 0036
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

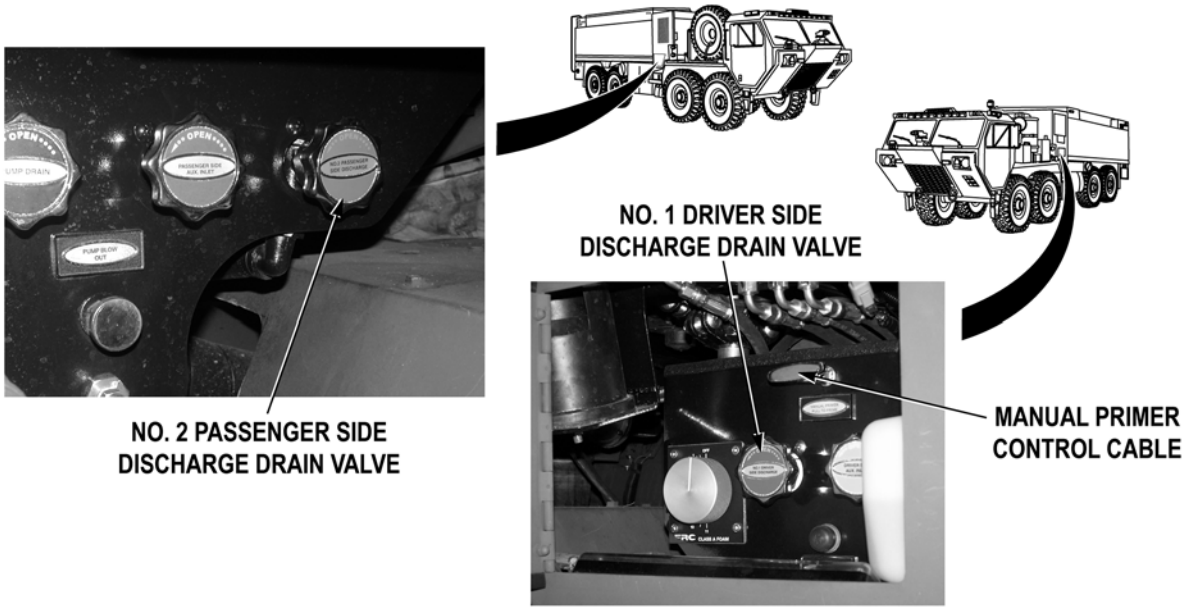
PUMP DOES NOT PRIME



Step 1. Check if PUMP DRAIN valve is in closed position (WP 0004).

If PUMP DRAIN valve is not in closed position, close it (WP 0004).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



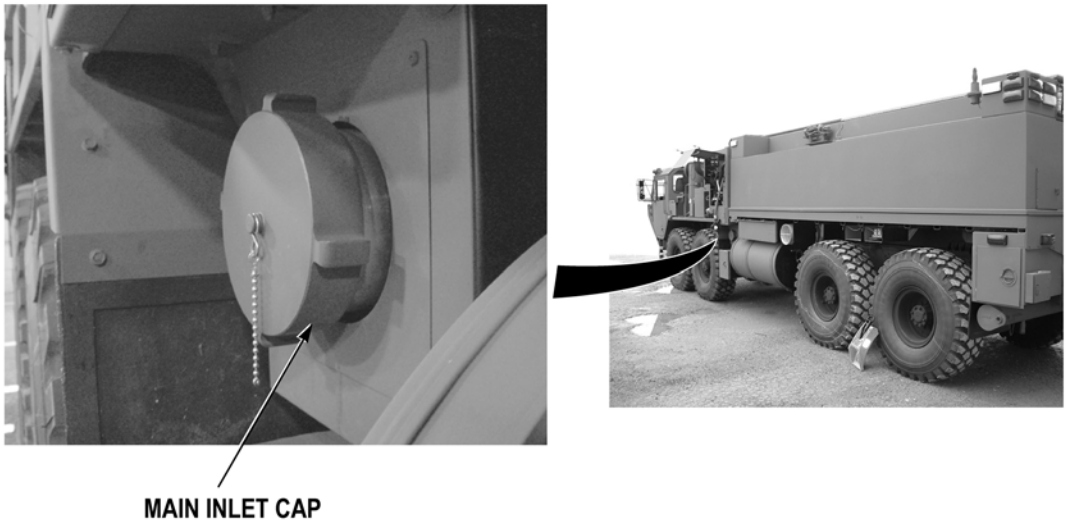
Step 2. Check if all DISCHARGE drain valves are in closed position (WP 0004).

If DISCHARGE drain valves are not in closed position, put drain valves to closed position (WP 0004).

Step 3. Check if MANUAL PRIMER control cable is fully retracted (WP 0036).

If MANUAL PRIMER control cable is not fully retracted, push handle in until cable is fully retracted (WP 0036).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



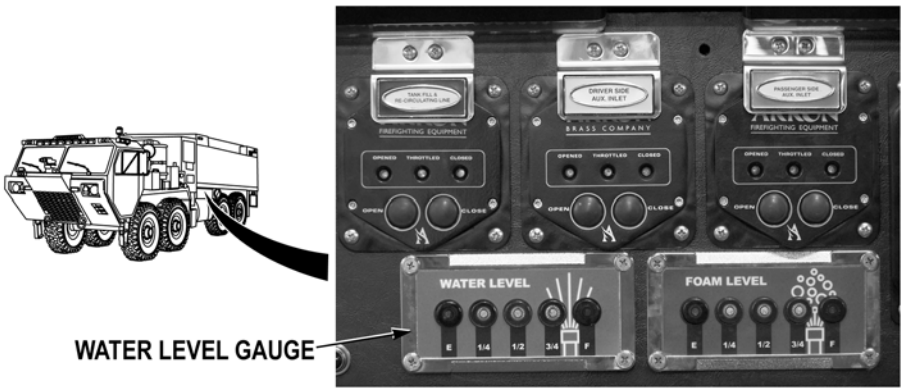
NOTE

Inlet pressure can be observed at pressure governor control, Pump Intake Pressure display (WP 0016). When pumping from onboard water tank (WP 0018), or draft (WP 0017), pressure governor should indicate vacuum up to -30 in. Hg (76.2 cm Hg), when pumping from DRIVER SIDE AUX. INLET or PASSENGER SIDE AUX. INLET from hydrant or in relay (WP 0019), discharge pressure should indicate up to 300 psi (2069 kPa).

Step 4. If pumping from onboard water tank (WP 0018) or auxiliary inlets (WP 0019), check if main inlet cap is tight and free from damage.

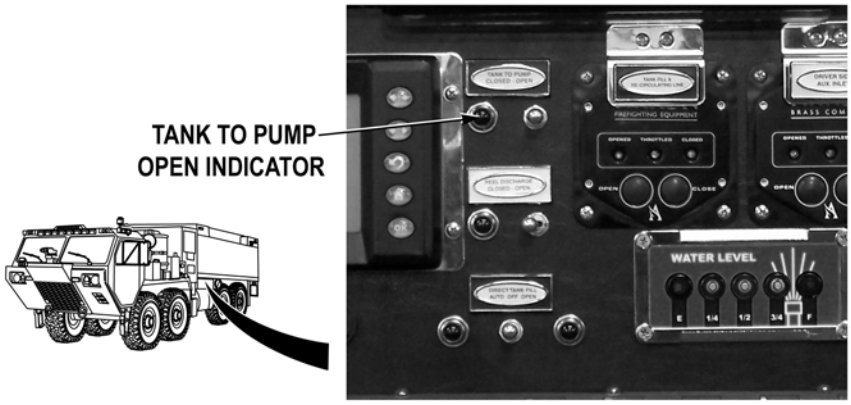
If main inlet cap is loose or damaged, tighten loose or replace damaged main inlet cap (WP 0341).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. If pumping from onboard water tank (WP 0018), check onboard water water tank level using cab or pump operator's panel WATER LEVEL gauge (WP 0004).

If water level is low, fill onboard water tank (WP 0014).



Step 6. If pumping from onboard water tank (WP 0018), check if TANK TO PUMP indicator is illuminated (WP 0004).

If indicator is not illuminated, put TANK TO PUMP switch to OPEN position and release (WP 0004). If indicator does not remain illuminated when switch is released, notify Supervisor.

Step 7. If pumping from draft (WP 0017), check if suction hose is free from blockage.

If suction hose is blocked, remove blockage.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 8. If pumping from draft (WP 0017), check if suction hose is placed so vertical height between suction hose strainer and pump is not more than 10 ft. (3 m).

If vertical height between suction hose strainer and pump is more than 10 ft. (3 m), reposition vehicle to reduce vertical height.

Step 9. If pumping from hydrant or relay (WP 0019), check if intake pressure is present.

If intake pressure is not present, correct problem or notify Supervisor.

Step 10. If problem still exists, prime pump using manual priming control cable (WP 0036).

a. If system primes using manual priming control cable, complete mission per SOP and notify Supervisor.

b. If system does not prime using manual priming control cable, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PUMP LOSES PRIME OR PRESSURE GOVERNOR DISPLAYS LOW SUPPLY OR PRESET NOT MET, AND PUMP RETURNS TO IDLE MODE

INITIAL SETUP:

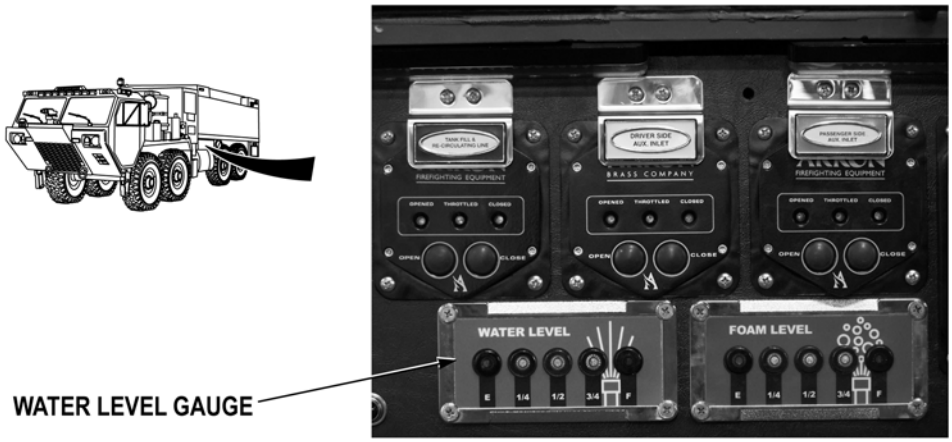
References
WP 0004
WP 0014
WP 0015
WP 0017
WP 0018

References (continued)
WP 0019
WP 0049

Equipment Conditions
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

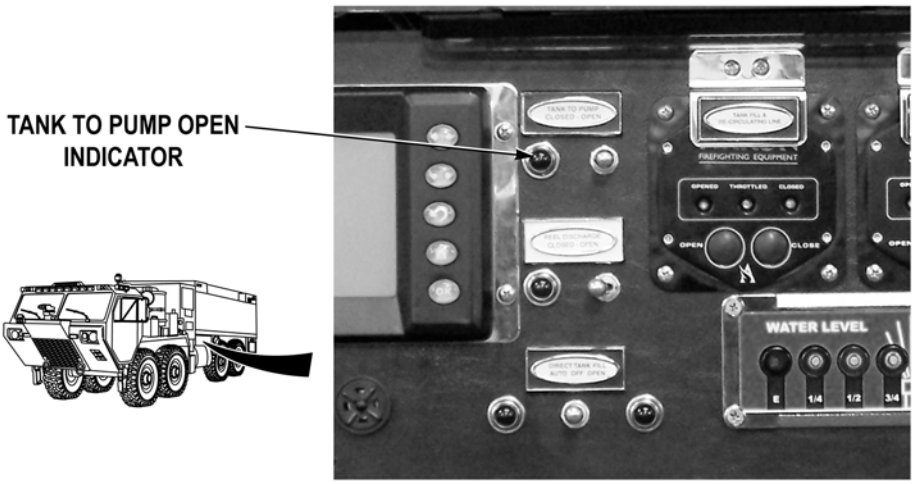
PUMP LOSES PRIME OR PRESSURE GOVERNOR DISPLAYS LOW SUPPLY OR PRESET NOT MET, AND PUMP RETURNS TO IDLE MODE



Step 1. If pumping from onboard water tank (WP 0018), check tank water level using cab or pump operator's panel WATER LEVEL gauge (WP 0004).

If water level is low, fill tank (WP 0014) and go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. If pumping from onboard water tank (WP 0018), check if TANK TO PUMP open indicator is illuminated (WP 0004).

If indicator is not illuminated, put TANK TO PUMP switch to OPEN position (WP 0004) and release. If indicator does not remain illuminated when switch is released, notify Supervisor.

Step 3. If pumping from draft (WP 0017), check if suction hose is free from blockage.

If suction hose is blocked, remove blockage and go to Step 6.

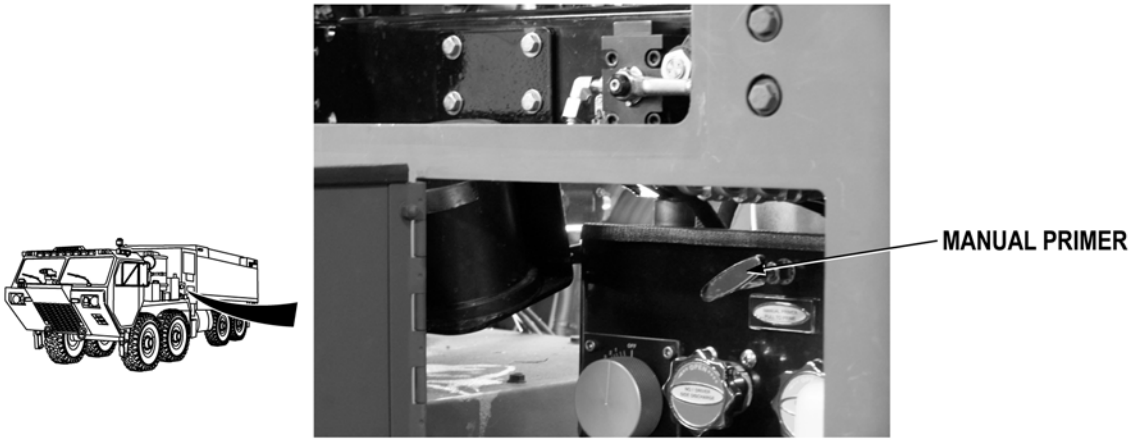
Step 4. If pumping from draft (WP 0017), check if suction hose is placed so vertical height between suction hose strainer and water pump is not more than 10 ft. (3 m).

If vertical height between suction hose strainer and water pump is more than 10 ft. (3 m), reposition vehicle to reduce vertical height and go to Step 6.

Step 5. If pumping from hydrant or relay (WP 0019), check if pressure governor control indicates intake pressure.

If intake pressure is not present, correct water supply problem and go to Step 6 or notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Operate primer system in manual mode, check if system can be primed (WP 0015).

If system does not prime, troubleshoot Pump Does Not Prime (WP 0049).

Step 7. Operate system per SOP. Monitor system for reoccurrence of fault.

a. If fault does not reoccur, complete mission per SOP and notify Supervisor.

b. If fault reoccurs, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

DRAIN VALVES OR MAIN INLET CAP LEAKING DURING PUMPING OPERATIONS

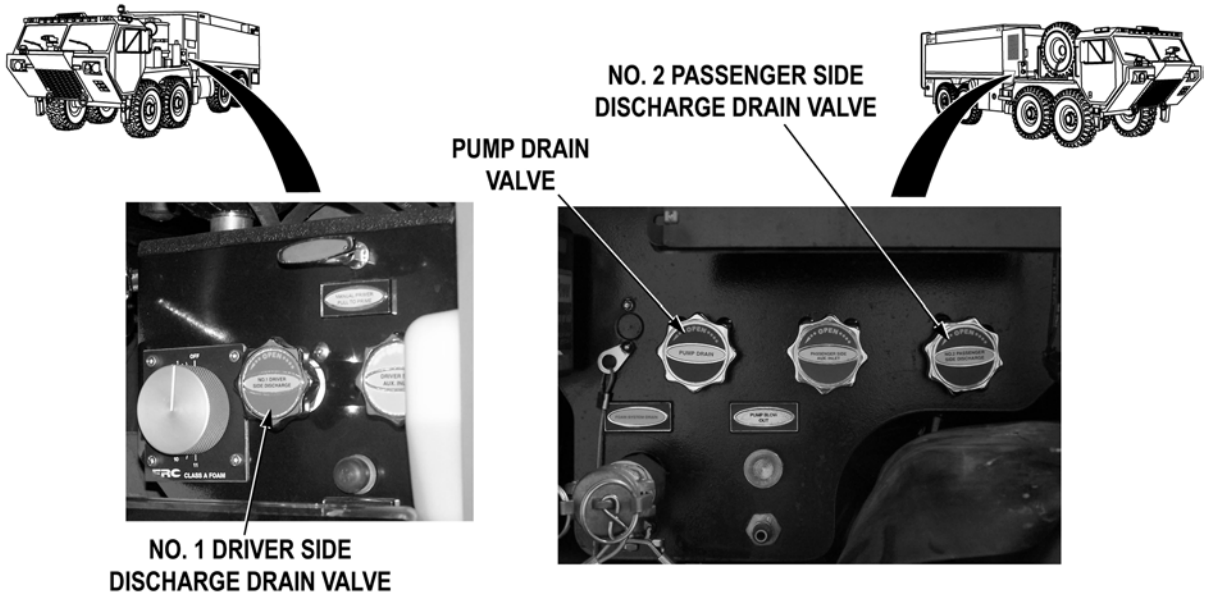
INITIAL SETUP:

References
WP 0004

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DRAIN VALVES OR MAIN INLET CAP LEAKING DURING PUMPING OPERATIONS



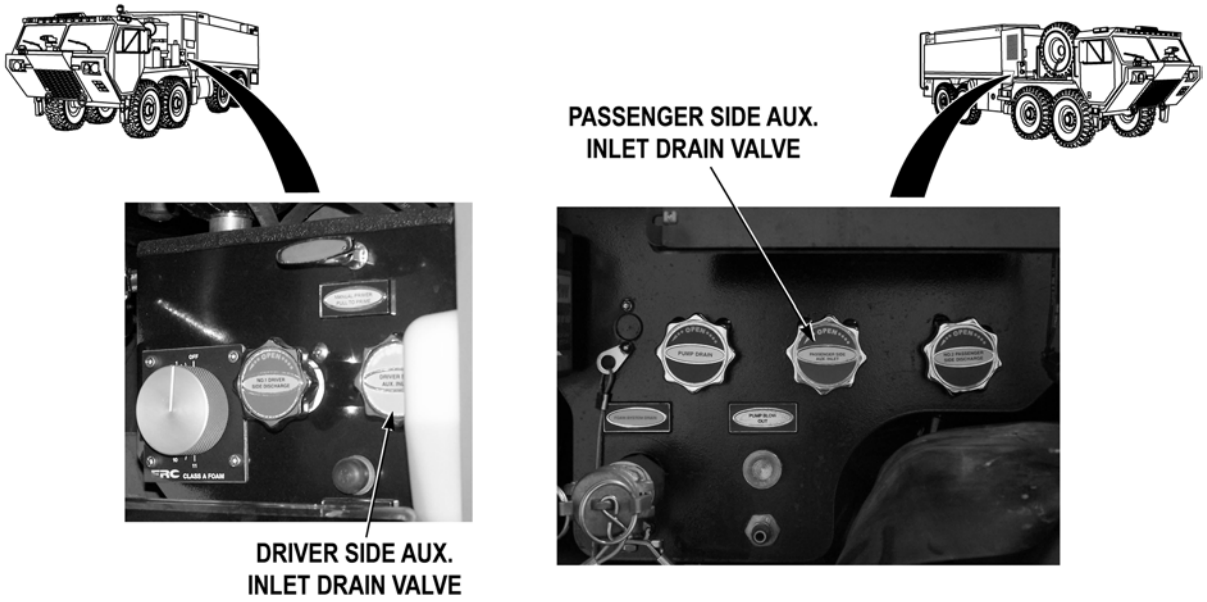
Step 1. Check if pump drain valve is closed (WP 0004).

If pump drain valve is open, close it (WP 0004).

Step 2. Check if discharge drain valves are closed (WP 0004).

If discharge drain valves are open, close them (WP 0004).

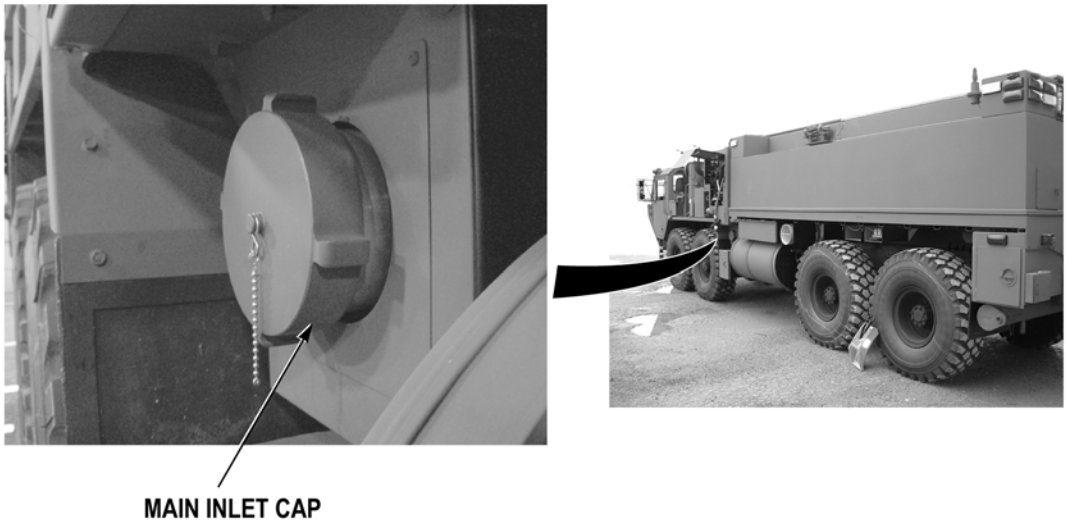
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. If using auxiliary inlet connects, check if auxiliary inlet drain valves are closed (WP 0004).

If auxiliary inlet drain valves are open, close them (WP 0004).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Perform Step 4 only when mission allows shutdown of pumping operations.

Step 4. If main inlet cap is leaking, shut down pumping operations, shut off water supply, and check if main inlet cap is tight and free from damage.

a. If main inlet cap is loose or damaged, tighten loose or replace damaged main inlet cap (WP 0341).

b. If main inlet cap is tight and free from damage, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

HANDHELD RADIO BATTERY CHARGER(S) DOES NOT CHARGE BATTERIES

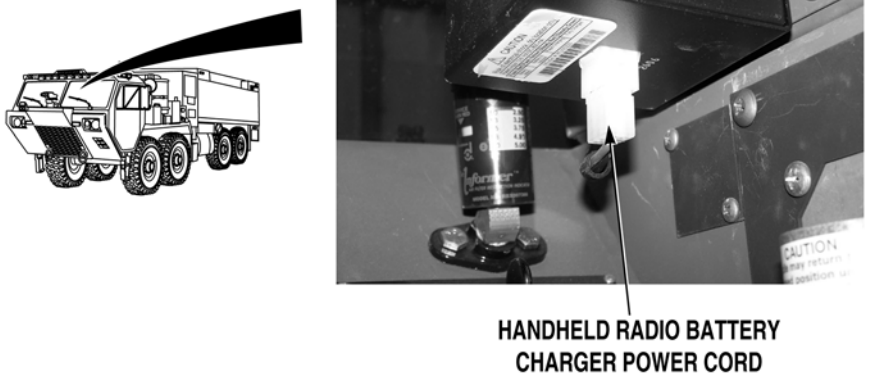
INITIAL SETUP:

References
WP 0258

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

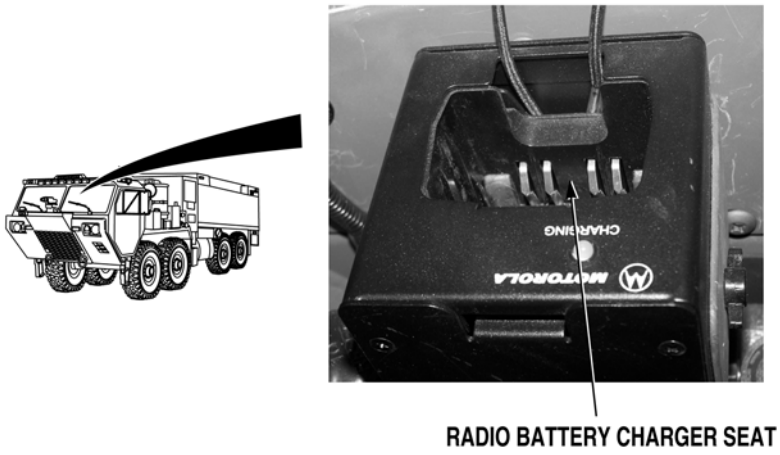
HANDHELD RADIO BATTERY CHARGER(S) DOES NOT CHARGE BATTERIES



Step 1. Check if handheld radio battery charger power cord is properly connected to handheld radio battery charger.

If handheld radio battery charger power cord is not properly connected to handheld radio battery charger, reconnect cord (WP 0258).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Check if handheld radio is fully seated in handheld radio battery charger.

a. If handheld radio is not fully seated in handheld radio battery charger, reseat radio.

b. If handheld radio is fully seated in handheld radio battery charger, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

SCENE LIGHTS, STEP LIGHTS, CAB DOME LIGHTS, CLEARANCE LIGHTS, AND STOWAGE COMPARTMENT LIGHTS OR WARNING LIGHTS DO NOT OPERATE

INITIAL SETUP:

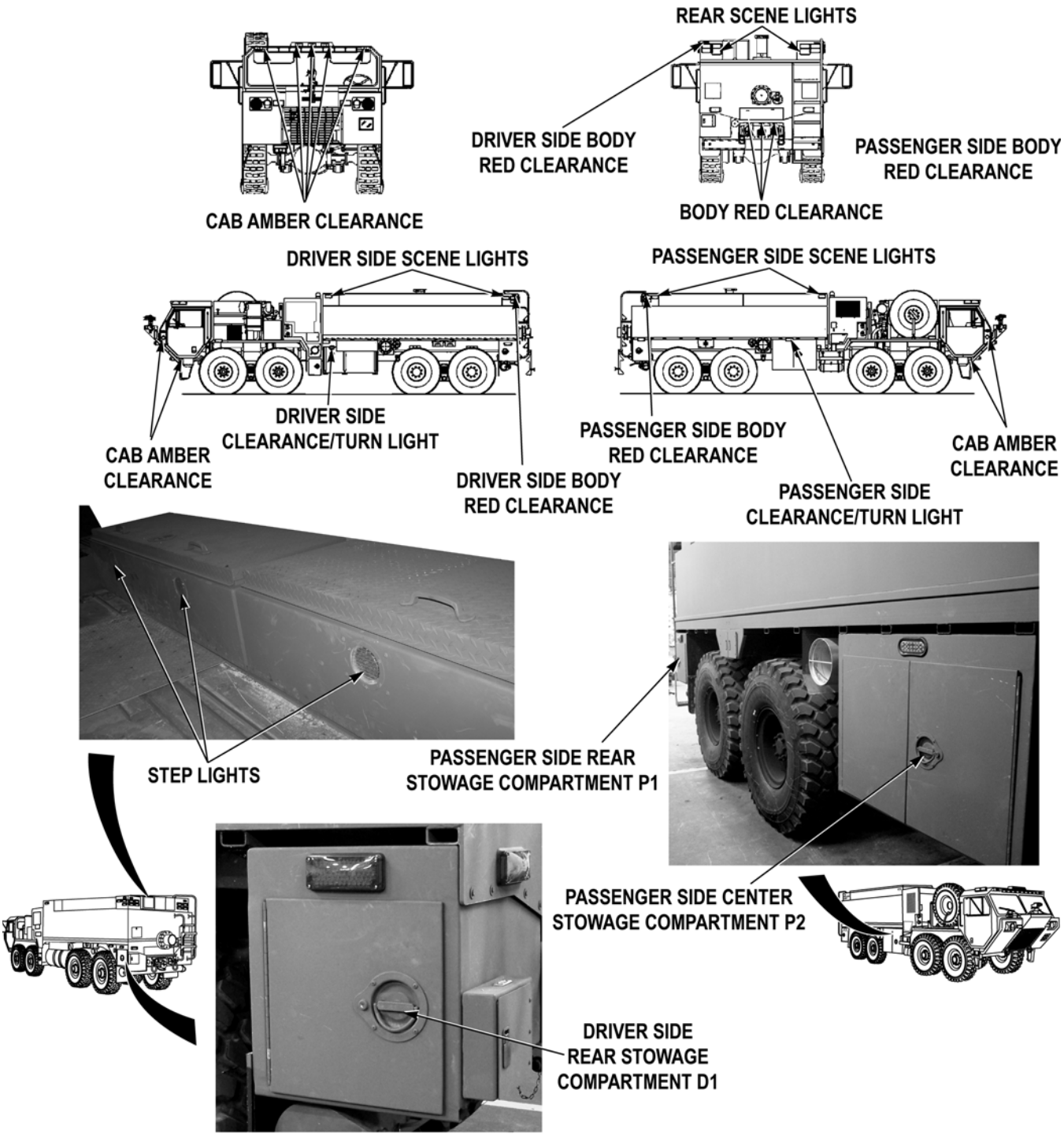
References
TM 9-2320-279-10
WP 0004
WP 0007

Equipment Conditions
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

SCENE LIGHTS, STEP LIGHTS, CAB DOME LIGHTS, CLEARANCE LIGHTS, AND STOWAGE COMPARTMENT LIGHTS DO NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



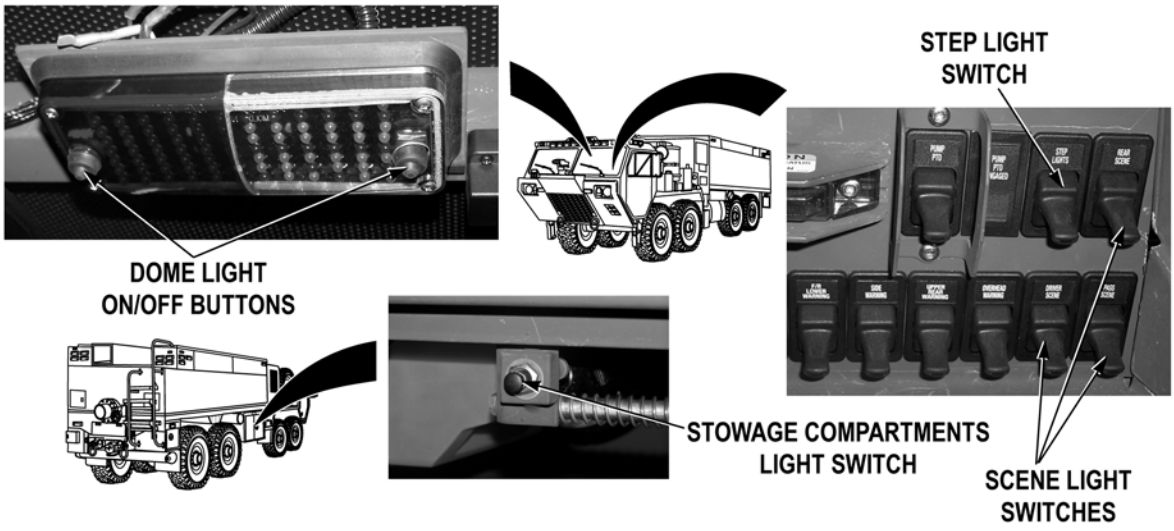
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 1. Push battery disconnect switch to on position (WP 0007). Check if service drive lights are on (not in blackout mode) (TM 9-2320-279-10).

If service drive lights are not on, Turn Service Drive Lights On (TM 9-2320-279-10).



NOTE

- Compartment lights are turned on when service drive lights are turned on and compartment doors are opened.
- HEWATT body clearance lights are turned on when CL LPS switch is put to on position (TM 9-2320-279-10).

Step 2. Check if selected light switch is in on position (WP 0004).

a. If switch is not in on position, put switch to on position (WP 0004).

b. If switch is in on position, notify Supervisor.

END OF TASK

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING LIGHTS DO NOT OPERATE

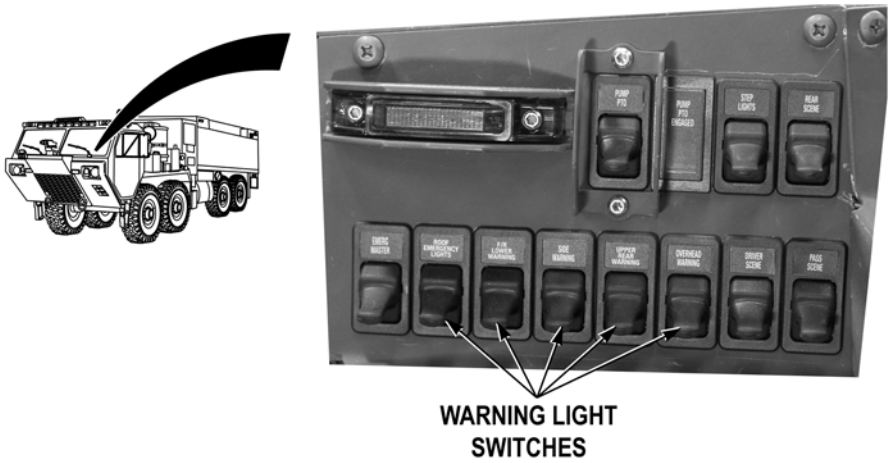
Step 1. Check if vehicle service drive lights are on (not in blackout mode) (TM 9-2320-279-10).

If service drive lights are not on, Turn Service Drive Lights On (TM 9-2320-279-10).

Step 2. Check if EMERG MASTER switch is in on position (WP 0004).

If switch is not in on position, put EMERG MASTER switch to on position (WP 0004).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Check if selected warning light switch is in on position (WP 0004).

a. If switch is not in on position, put switch to on position (WP 0004).

b. If switch is in on position, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

DISCHARGES HAVE ABNORMAL WATER STREAM

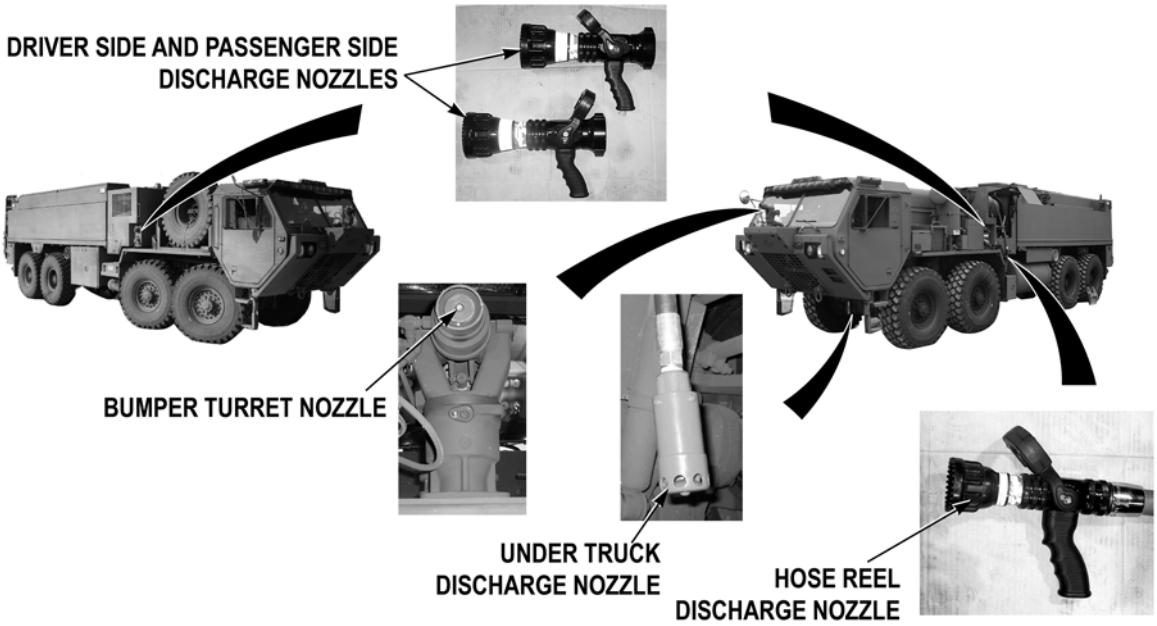
INITIAL SETUP:

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DISCHARGES HAVE ABNORMAL WATER STREAM

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Vehicle engine must be turned off and all water pressure relieved from system before performing the following procedures. Failure to comply may cause injury to personnel.

Step 1. Check if discharge nozzles are free from dirt, debris, and obstructions.

a. If discharge nozzles are not free from dirt, debris, and obstructions, clean obstructions from faulty discharge nozzle.

b. If discharge nozzles are free from dirt, debris, obstructions, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

HYDRAULIC HEAT EXCHANGER FAN(S) DO NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0016
WP 0131

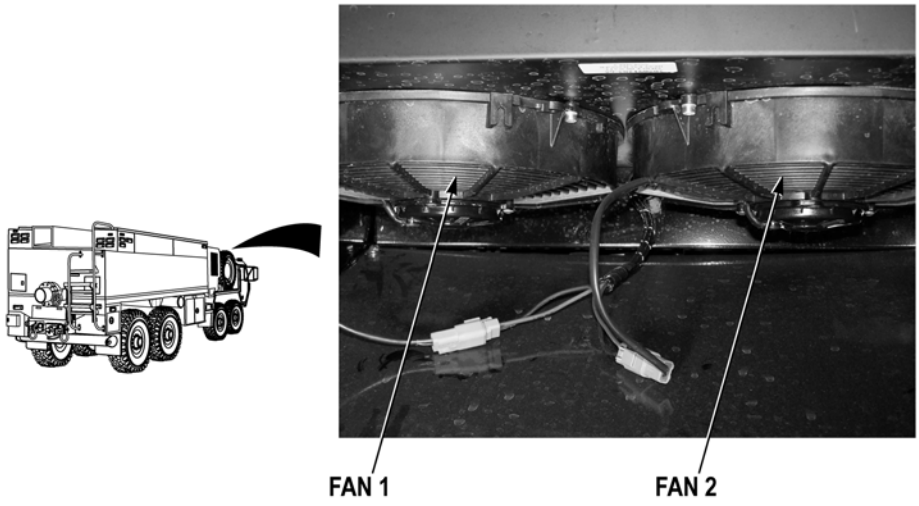
References (continued)
WP 0132
WP 0134
WP 0261
WP 0262
WP 0300
WP 0303
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HYDRAULIC HEAT EXCHANGER FAN(S) DO NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Hydraulic oil must be over 125° F (52°C) before performing Step (1). Hydraulic oil temperature may be observed at either cab pressure governor control or pump operator's panel pressure governor control (WP 0016).

Step 1. Push battery disconnect switch to on position (WP 0007). Start Engine (TM 9-2320-279-10). Put PUMP PTO switch to on position (WP 0004). Put cab TANK TO PUMP switch to on position (WP 0004). Enable pressure governor control (WP 0016). Allow hydraulic system to warm to 125° F (52°C) or greater. Turn Engine Off (TM 9-2320-279-10). Remove pump house panel H (WP 0341). While an assistant observes Hyd Oil Temp segment of pressure governor control, ensuring that hydraulic oil temperature is 125° F (52°C) or greater, check if fan 1 operates.

If fan 1 does not operate, go to Step 3.

Step 2. While an assistant observes Hyd Oil Temp segment of cab or pump operator's panel pressure governor control, ensuring that hydraulic oil temperature is 125°F (52°C) or greater, check if fan 2 operates.

a. If fan 2 operates, go to Step 4.

b. If fan 2 does not operate, go to Step 16.

Step 3. While an assistant observes Hyd Oil Temp segment of cab or pump operator's panel pressure governor control, ensuring that hydraulic oil temperature is 125°F (52°C) or greater, check if fan 2 operates.

a. If fan 2 operates, go to Step 10.

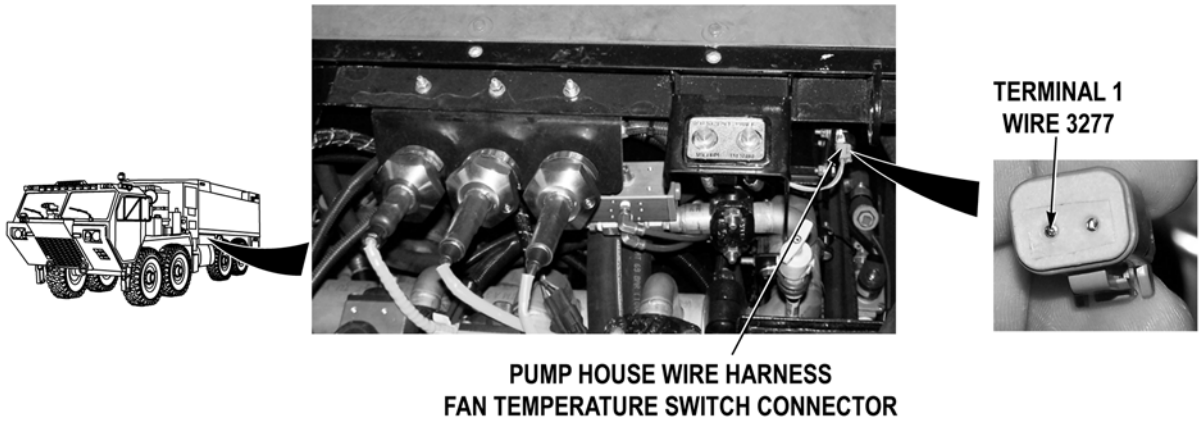
b. If fan 2 does not operate, go to Step 5.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 4. With hydraulic oil temperature at 125°F (52°C) or greater, check if cab or pump operator's panel pressure governor control displays Hydraulic Oil At A Critical Level (WP 0016).

a. If pressure governor control displays, Hydraulic Oil At A Critical level, clean hydraulic heat exchanger external cooling fins or replace hydraulic heat exchanger (0132).

b. If pressure governor control does not display, Hydraulic Oil At A Critical Level, fault corrected.



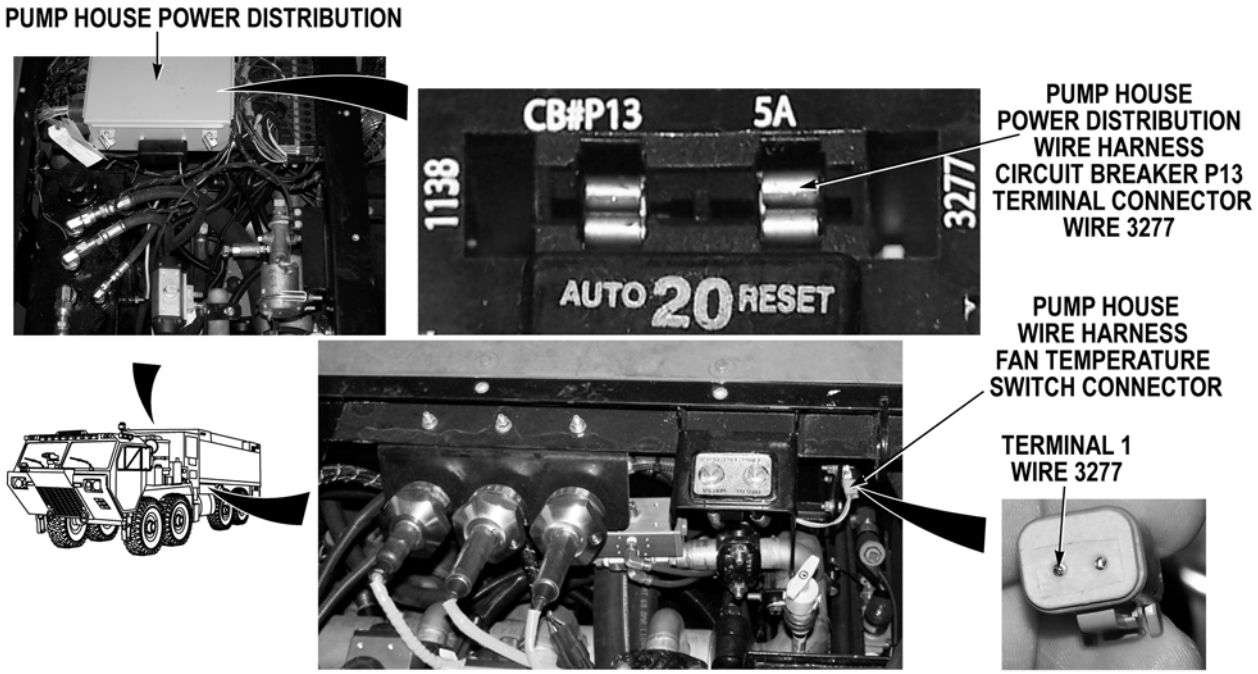
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Remove pump house panel K (WP 0341). Disconnect pump house wire harness fan temperature switch connector. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 3277 (gray) from fan temperature switch connector, terminal 1 to a known good ground.

If 22 to 28 VDC are present, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

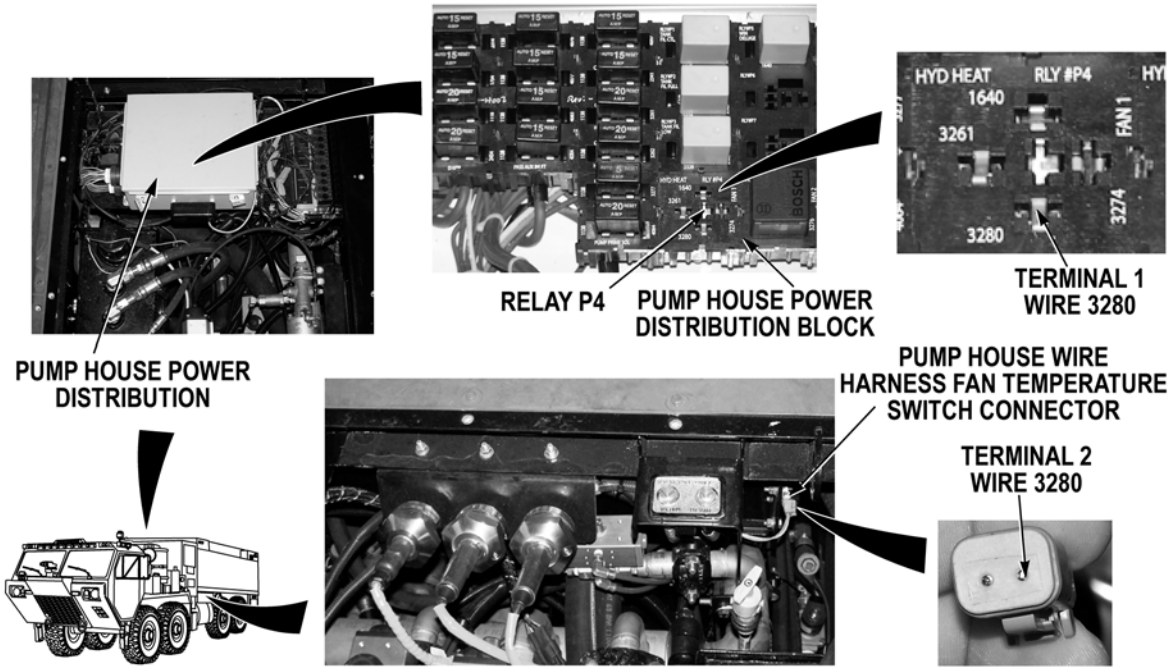


Step 6. Open pump house power distribution (WP 0261). Remove circuit breaker P13 from pump house power distribution block (WP 0261). With a lead test set, check for continuity across pump house wire harness wire 3277 (gray) from pump house power distribution block circuit breaker P13 terminal connector, to pump house wire harness fan temperature switch connector, terminal 1.

a. If there is continuity, replace circuit breaker P13 (WP 0261).

b. If there is no continuity, go to Step 9.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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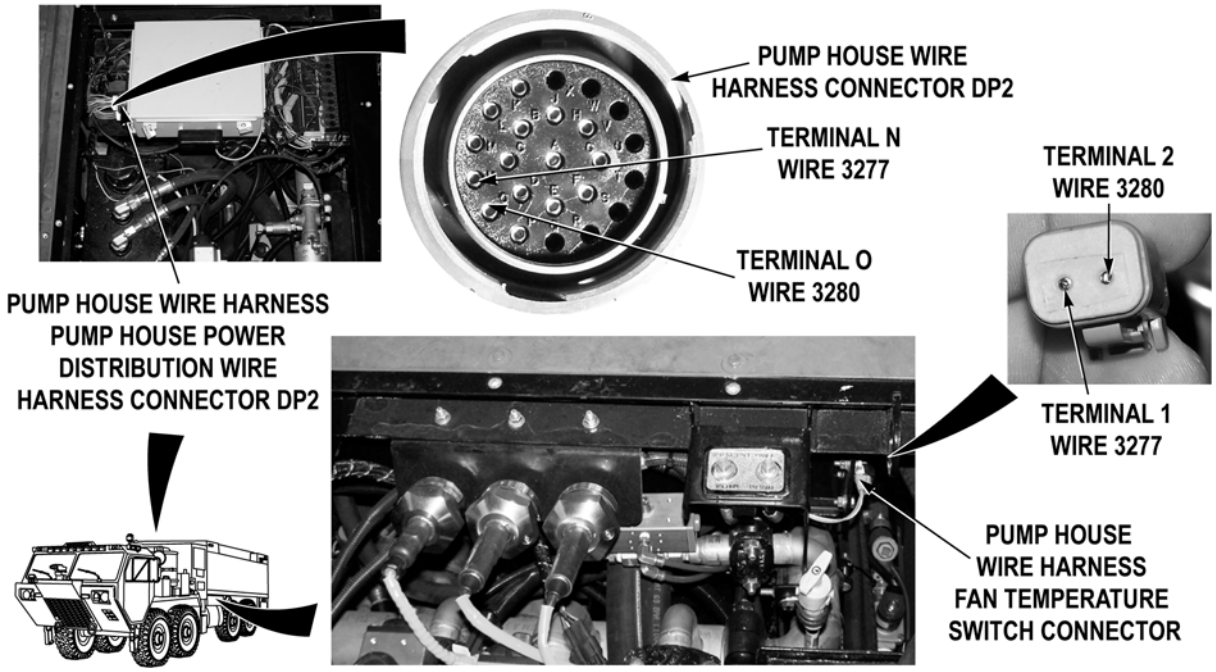
Step 7. Pull battery disconnect switch to off position (WP 0007). Remove relay P4 from pump house power distribution block (WP 0262). With a test lead set, check for continuity across pump house wire harness wire 3280 (yellow) from pump house wire harness fan temperature switch connector, terminal 2 to pump house power distribution block, relay P4 connector, terminal 1.

If there is continuity, replace fan temperature switch (WP 0131).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across wire 3280 (yellow) from pump house wire harness connector DP2, terminal O to pump house wire harness fan temperature switch connector, terminal 2.

a. If there is continuity, repair wire 3280 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

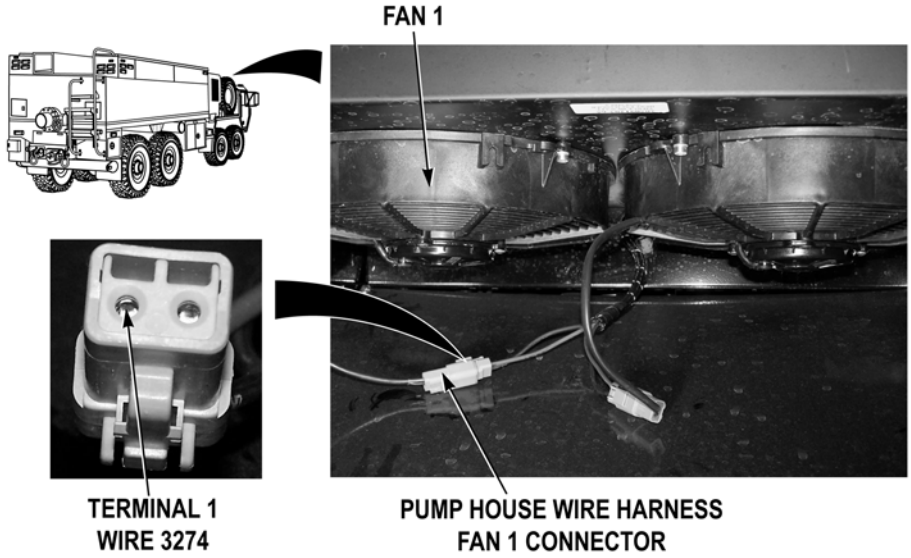
b. If there is no continuity, repair wire 3280 in pump house wire harness, if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 9. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across wire 3277 (gray) from pump house wire harness connector DP2, terminal N to pump house wire harness fan temperature switch connector, terminal 1.

a. If there is continuity, repair wire 3277 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

b. If there is no continuity, repair wire 3277 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

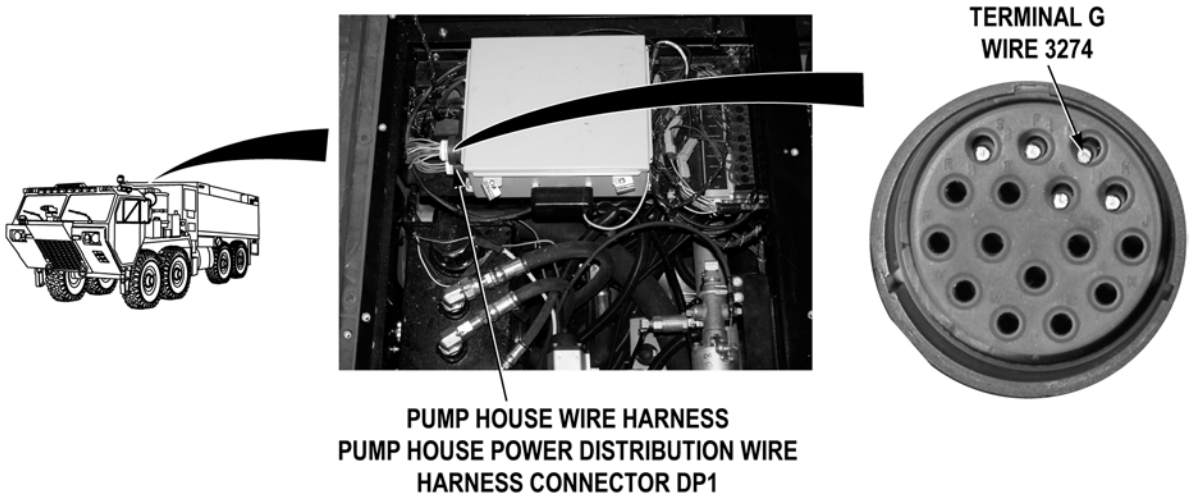
NOTE

Hydraulic oil must be over 125° F (52°C) before performing Step 10. Hydraulic oil temperature may be observed at either cab pressure governor control or pump operator's panel pressure governor control (WP 0016).

Step 10. Disconnect pump house wire harness fan 1 connector. While an assistant observes Hyd Oil Temp segment of pressure governor control, making sure that hydraulic oil temperature is 125° F (52°C) or greater, check for 22 to 28 VDC between pump house wire harness wire 3274 (red) from pump house wire harness fan 1 connector, terminal 1 to a known good ground.

If 22 to 28 VDC are present, go to Step 15.

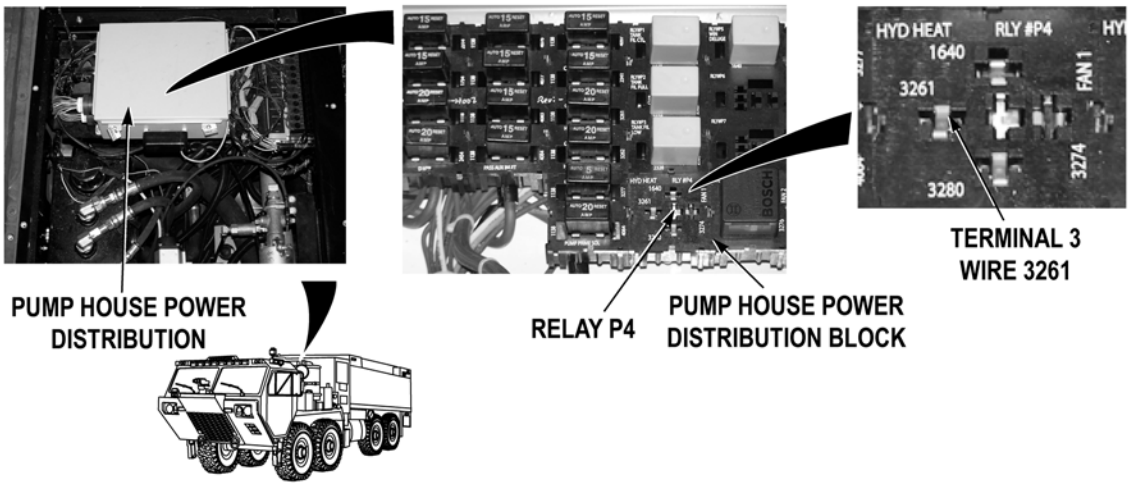
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Disconnect pump house wire harness pump house power distribution wire harness connector DP1. With a lead test set, check for 22 to 28 VDC between pump house power distribution wire harness wire 3274 (red) from pump house power distribution wire harness connector DP1, terminal G to a known good ground.

If 22 to 28 VDC are present, repair wire 3274 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

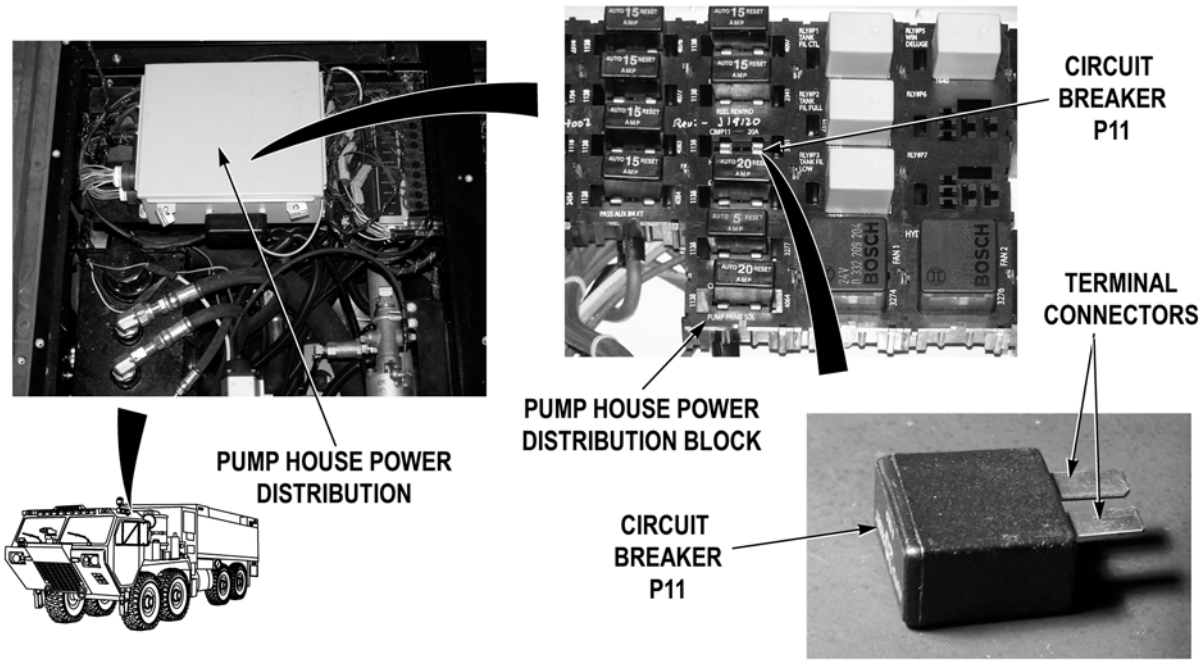
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Remove relay P4 from pump house power distribution block (WP 0262). With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 3261 (red) from pump house power distribution block relay P4 connector, terminal 3 to a known good ground.

If 22 to 28 VDC are present, go to Step 14.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

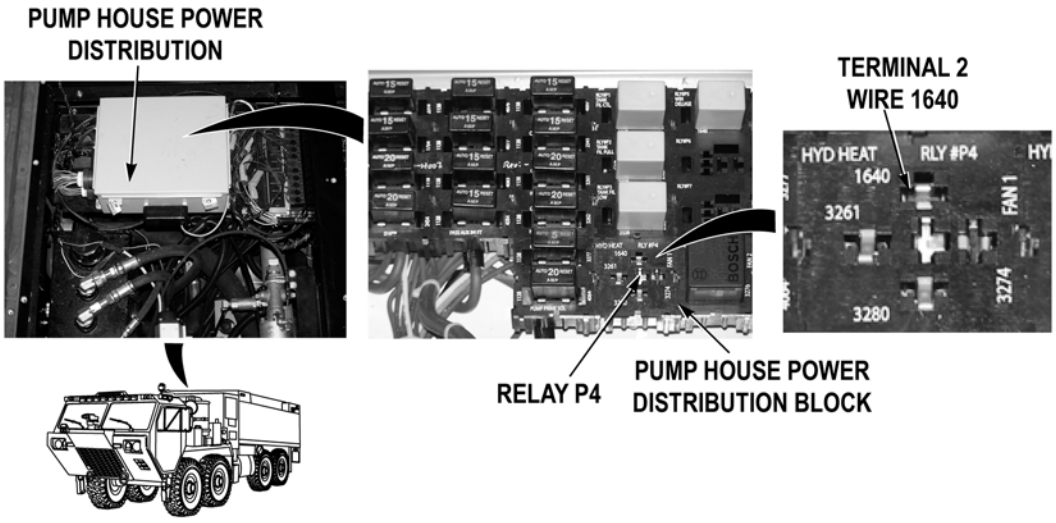


Step 13. Remove circuit breaker P11 from pump house power distribution block (WP 0261). Check for continuity across circuit breaker.

a. If there is continuity, replace pump house power distribution wire harness and block (WP 0300).

b. If there is no continuity, replace circuit breaker P11 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

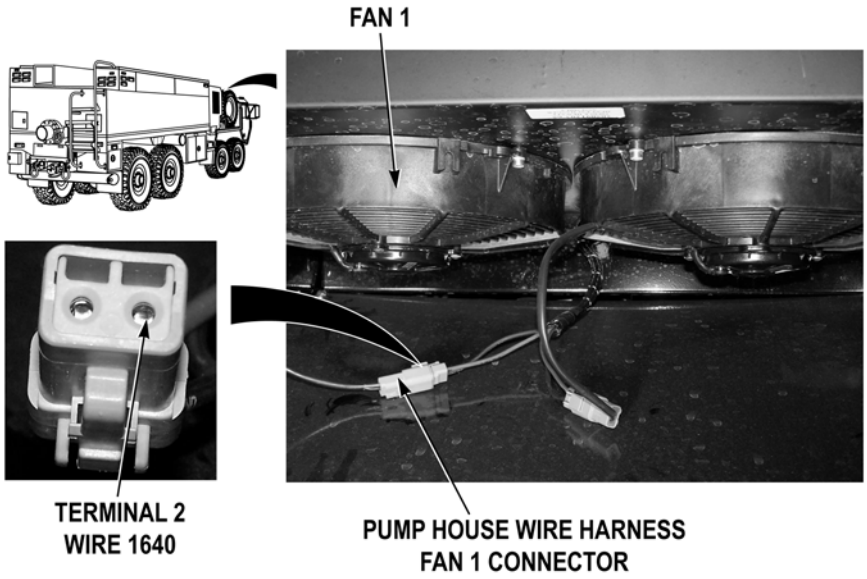


Step 14. Pull battery disconnect switch to off position (WP 0007). Check for continuity across pump house power distribution wire harness wire 1640 (black) from pump house power distribution block relay P4 connector, terminal 2 and a known good ground.

a. If there is continuity, replace relay P4.

b. If there is no continuity, replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

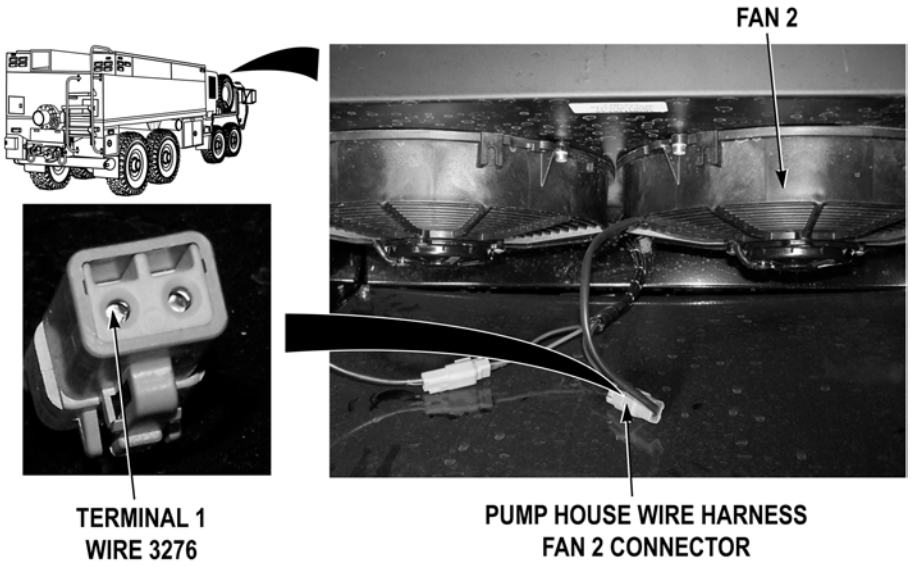


Step 15. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump house wire harness wire 1640 (black) from pump house wire harness fan 1 connector, terminal 2 to a known good ground.

a. If there is continuity, replace fan 1 (WP 0134).

b. If there is no continuity, repair wire 1640 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

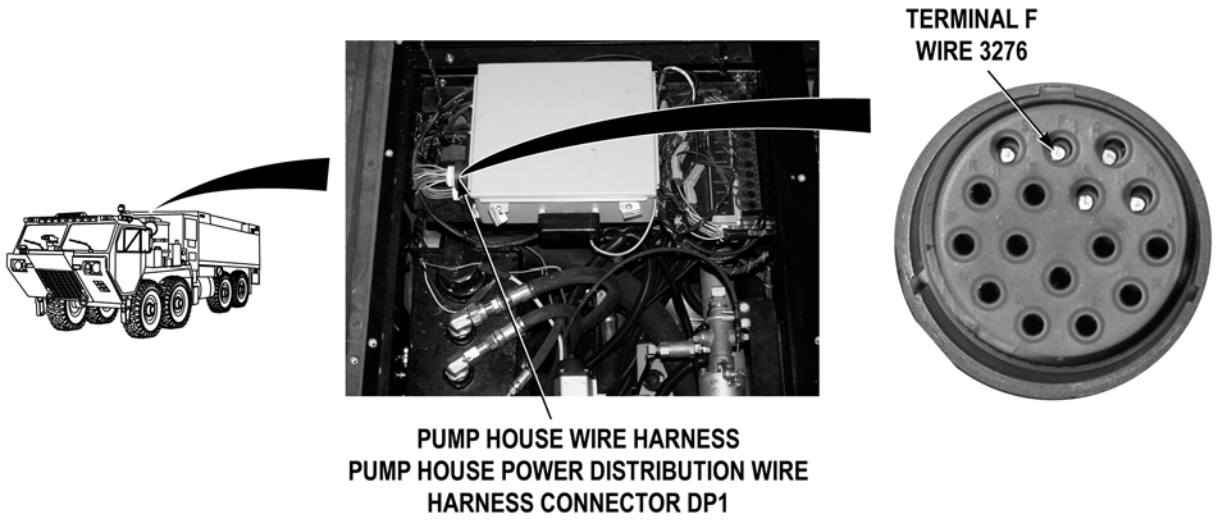
NOTE

Hydraulic oil must be over 125° F (52°C) before performing Step 16. Hydraulic oil temperature may be observed at either cab pressure governor control or pump operator's panel pressure governor control (WP 0016).

Step 16. Disconnect pump house wire harness fan 2 connector. While an assistant observes Hyd Oil Temp segment of pressure governor control, making sure that hydraulic oil temperature is 125° F (52°C) or greater. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 3276 (red) from pump house wire harness fan 2 connector, terminal 1 to a known good ground.

If 22 to 28 VDC are present, go to Step 21.

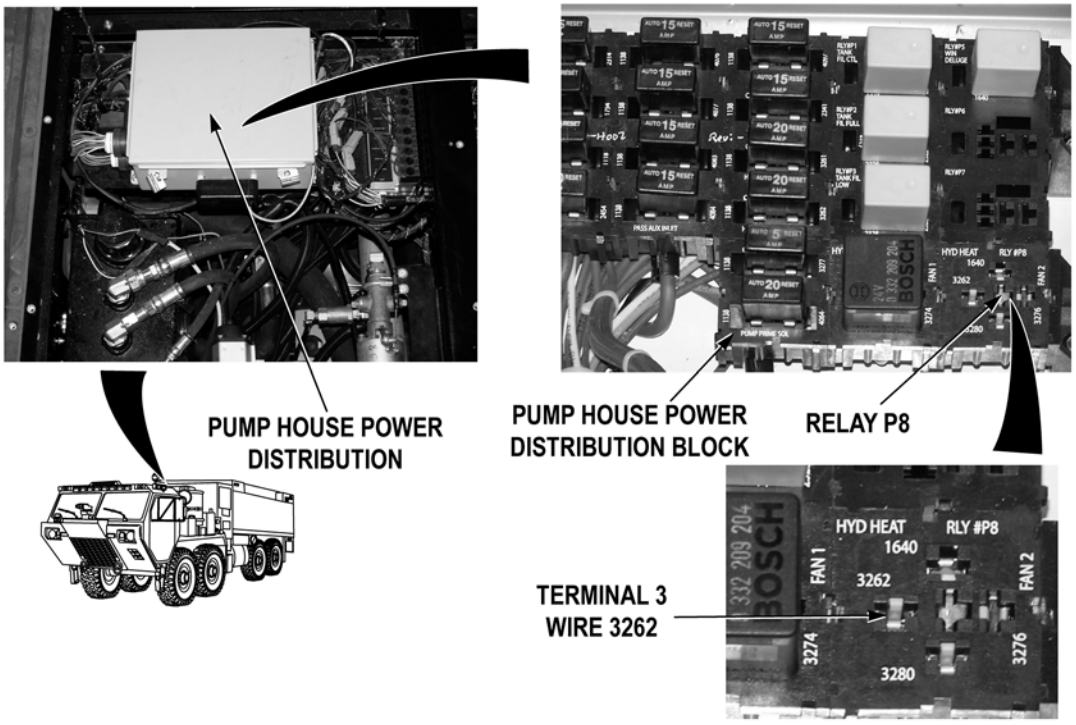
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Disconnect pump house wire harness pump house power distribution wire harness connector DP1. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 3276 (red) from pump house power distribution wire harness connector DP1, terminal F to a known good ground.

If 22 to 28 VDC are present, repair wire 3276 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

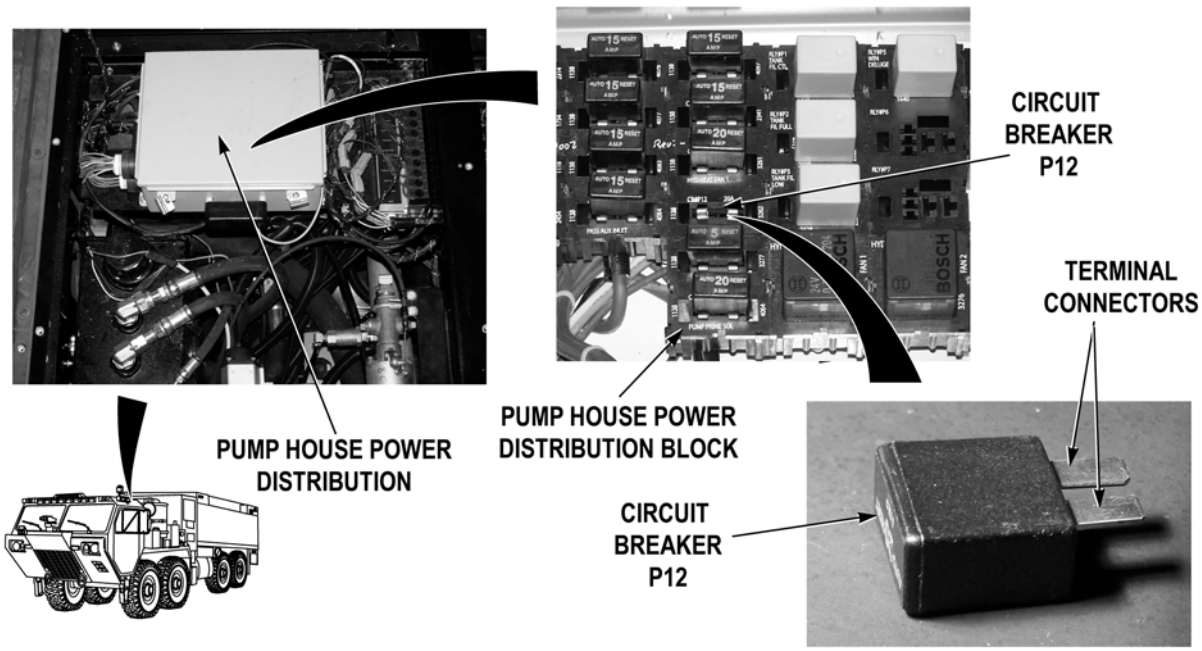
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Remove relay P8 from pump house power distribution block (WP 0262). Check for 22 to 28 VDC between pump house power distribution wire harness wire 3262 (red) from pump house power distribution block relay P8 connector, terminal 3 to a known good ground.

If 22 to 28 VDC are present, go to Step 20.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Remove circuit breaker P12 from pump house power distribution block (WP 0261). Check continuity of circuit breaker.

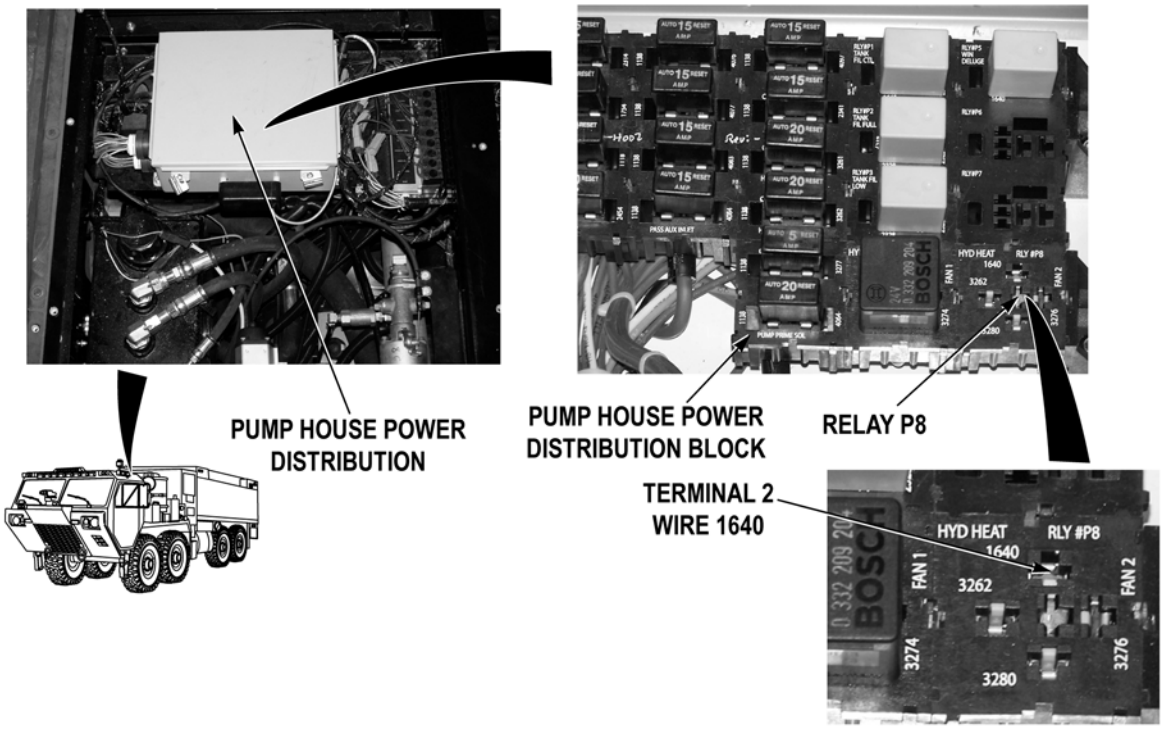
a. If there is continuity, replace pump house power distribution wire harness and block (WP 0300).

b. If there in no continuity, replace circuit breaker P12.

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

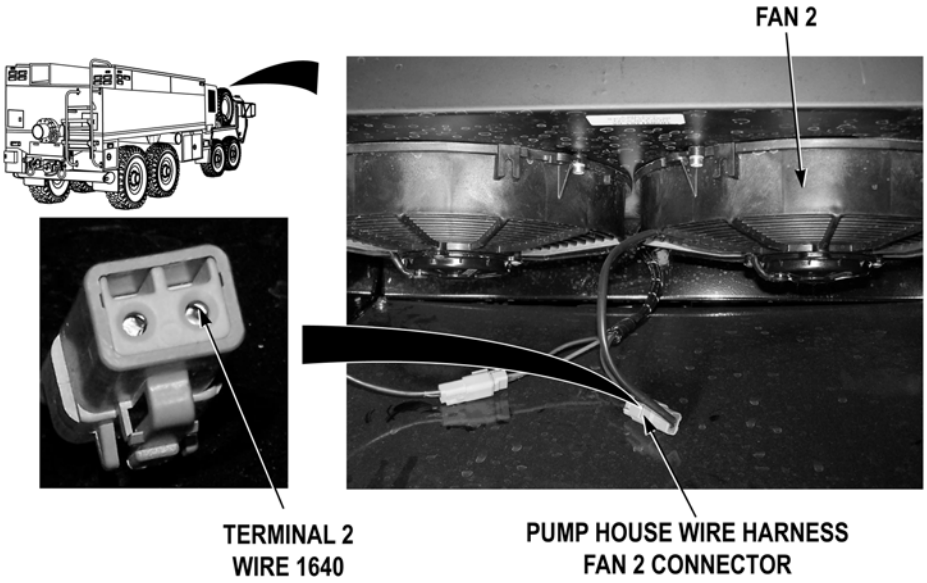


Step 20. Check for continuity across pump house power distribution wire harness wire 1640 (black) from pump house power distribution block relay P8 connector, terminal 2 and a known good ground.

a. If there is continuity, replace relay P8.

b. If there is no continuity, replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 21. With a test lead set, check for continuity across pump house wire harness wire 1640 (black) from pump house wire harness fan 2 connector, terminal 2 to a known good ground.

a. If there is continuity, replace fan 2 (WP 0134).

b. If there is no continuity, repair wire 1640 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM NOT DELIVERED FROM ALL SYSTEMS (BUMPER TURRET, UNDER TRUCK NOZZLES, AND MANUAL METERING CONTROLS) OR SYSTEM DOES NOT SHUT OFF

INITIAL SETUP:

Tools and Special Tools
Drain Pan (WP 0399, Item 4)
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0018
WP 0021
WP 0023
WP 0026
WP 0027
WP 0174
WP 0175
WP 0176
WP 0178
WP 0181

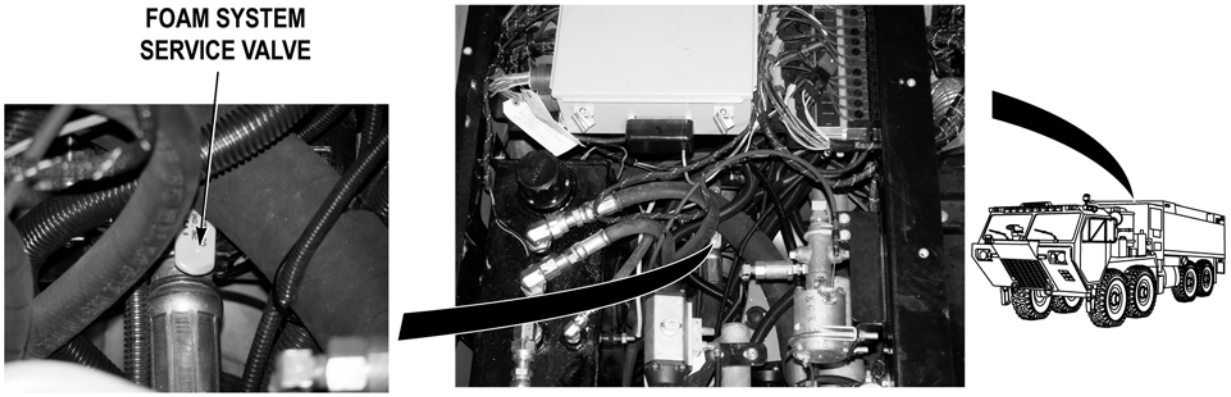
References (continued)
WP 0182
WP 0197
WP 0203
WP 0205
WP 0215
WP 0240
WP 0242
WP 0246
WP 0268
WP 0270
WP 0280
WP 0281
WP 0293
WP 0303
WP 0304
WP 0322
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

FOAM NOT DELIVERED FROM ALL SYSTEMS (BUMPER TURRET, UNDER TRUCK NOZZLES, AND MANUAL METERING CONTROLS) OR SYSTEM DOES NOT SHUT OFF

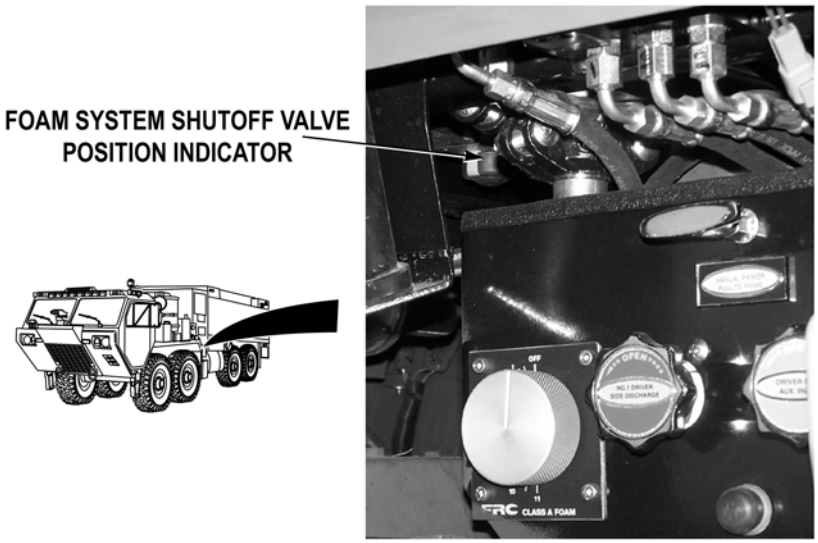
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Remove pump house panel K (WP 0341). Check if foam system service valve is in open position.

If foam system service valve is not in open position, position valve to open position (WP 0004).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 2. Push battery disconnect switch to on position (WP 0004). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Open pump house controls access panel (WP 0008). While an assistant puts and holds pump operator's panel FOAM SYSTEM switch in ON position (WP 0004), check if foam system shutoff valve operates to open position.

If foam system shutoff valve does not operate to open position, go to Step 40.

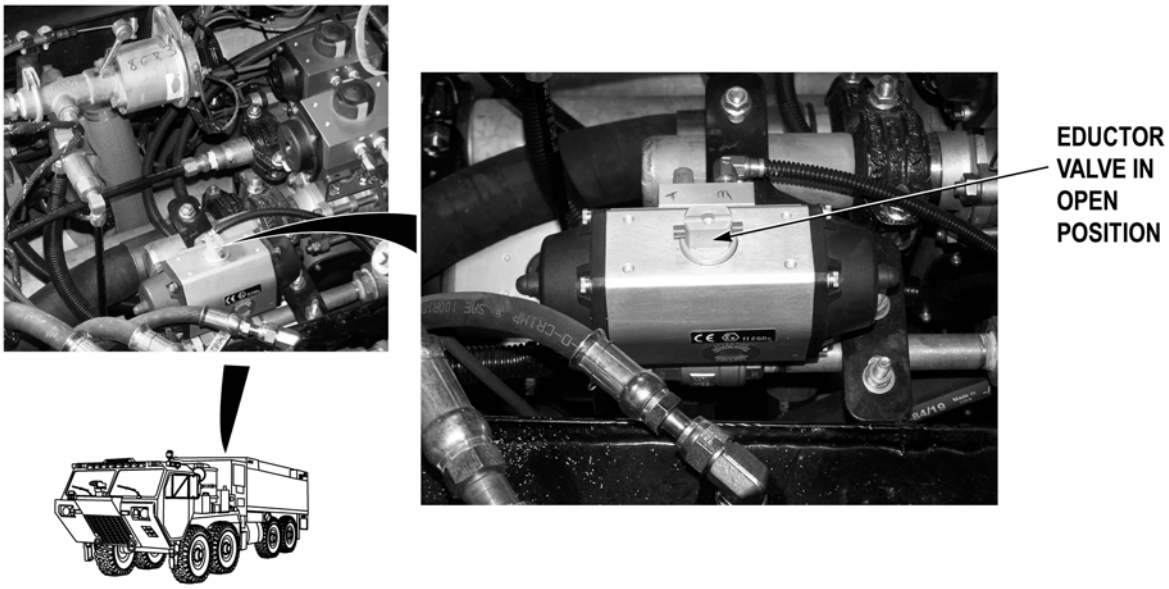
Step 3. Check if foam system shutoff valve remains in open position, when assistant releases pump operator's panel FOAM SYSTEM switch (WP 0004).

If foam system shutoff valve does not remain in open position, go to Step 31.

Step 4. While an assistant puts pump operator's panel FOAM SYSTEM switch to OFF position (WP 0004), check if foam system shutoff valve operates to closed position.

If foam system shutoff valve does not operate to closed position, go to Step 24.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. While an assistant puts pump operator's panel FOAM SYSTEM switch to ON position (WP 0004), check if eductor valve operates to open position.

If eductor valve does not operate to open position, go to Step 17.

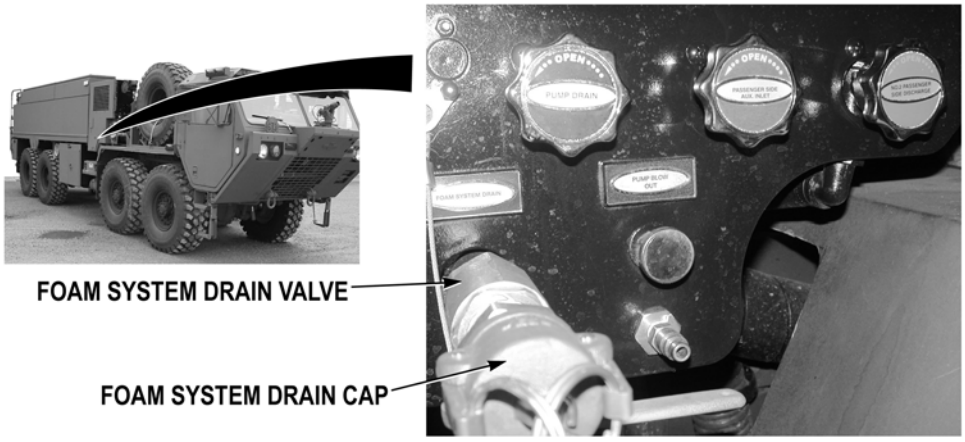
Step 6. Put pump operator's panel FOAM SYSTEM switch to OFF position (WP 0004) and release. While an assistant puts cab FOAM SYSTEM switch to on position (WP 0004), check if foam system shutoff valve operates to open position.

If foam system shutoff valve does not operate to open position, go to Step 15.

Step 7. While an assistant puts cab FOAM SYSTEM switch to off position (WP 0004), check if foam system shutoff valve operates to closed position.

If foam system shutoff valve does not operate to closed position, go to Step 14.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



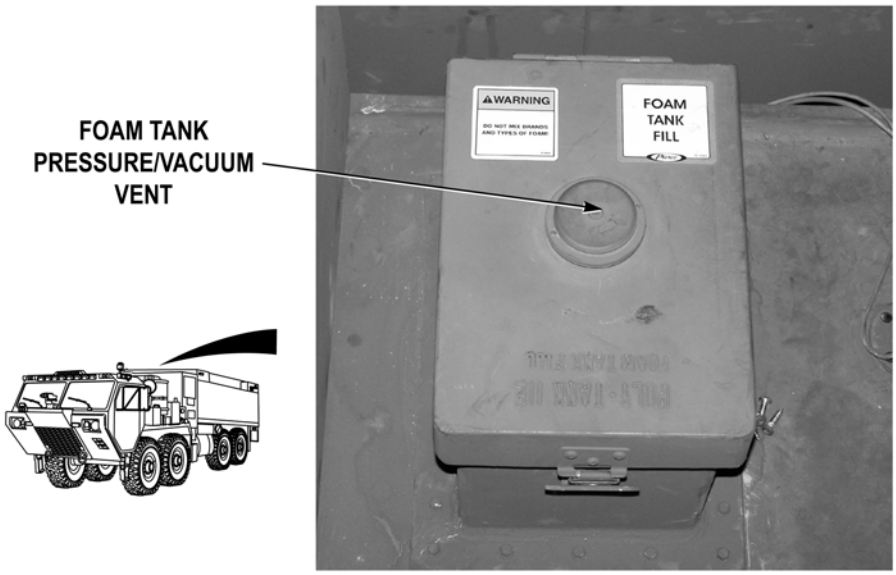
NOTE

Step 8 will check foam agent flow from foam tank to foam tank drain valve. If foam tank is empty, fill foam tank enough to complete check (WP 0021).

Step 8. Release FOAM SYSTEM switch (WP 0004). Position suitable drain pan under foam tank drain valve. Remove cap and open foam tank drain valve (WP 0021). Check if foam agent flows freely from foam tank drain valve.

If foam agent flows freely, go to Step 10.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

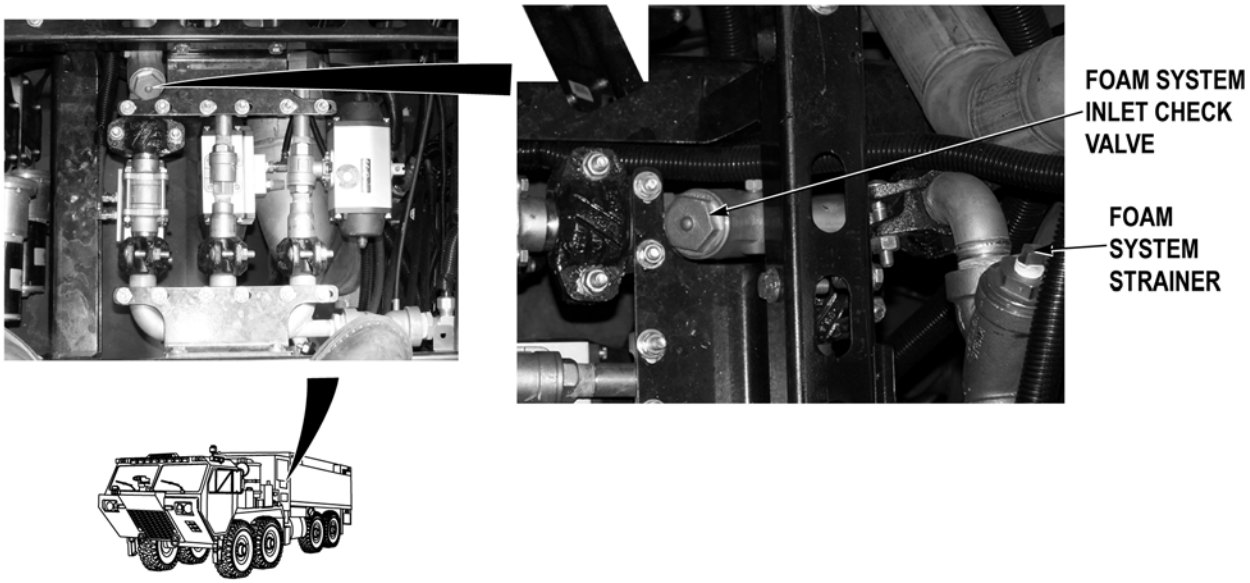


Step 9. Close foam tank drain valve (WP 0021). Remove foam tank pressure/vacuum vent (WP 0182). Close and latch FOAM TANK FILL cover (WP 0021). Open foam tank drain valve (WP 0004). Check if foam agent flows freely from foam tank drain valve.

a. If foam agent flows freely, clean or replace foam tank pressure/vacuum vent (WP 0182).

b. If foam agent does not flow freely, replace hose between foam tank and foam drain valve (WP 0322).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



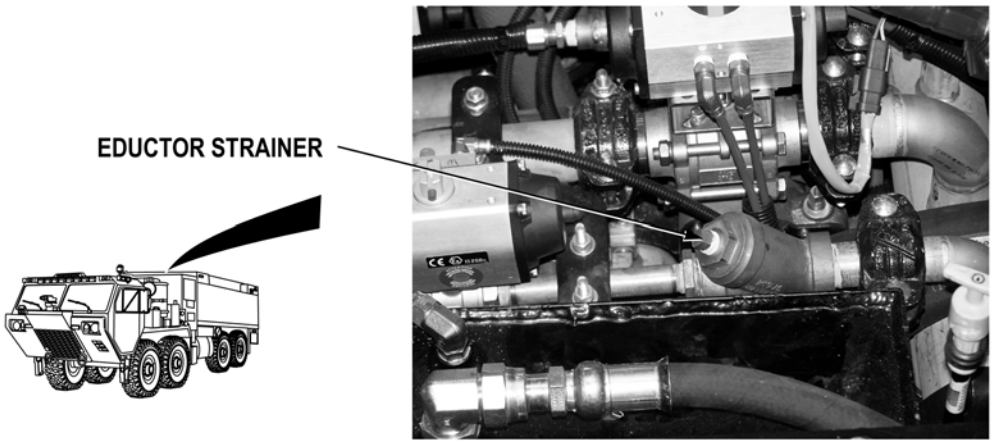
Step 10. Close foam tank drain valve and install cap (WP 0021). Close foam system service valve (WP 0004). Remove hose reel (WP 0246). Position suitable drain pan under foam system strainer. Remove plug and strainer screen from foam system strainer (WP 0181). Check if foam system strainer screen is free from clogs and damage.

If foam system strainer is clogged or damaged, clean or replace strainer screen (WP 0181).

Step 11. Install foam system strainer screen and plug (WP 0181). Remove foam system inlet check valve (WP 0178). Check if foam system inlet check valve is free from blockage and damage.

If foam system inlet check valve is blocked or damaged, remove blockage or replace foam system inlet check valve (WP 0178).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Install foam system inlet check valve (WP 0178). Remove plug and strainer screen from eductor strainer (WP 0181). Check eductor strainer screen for clogs and damage.

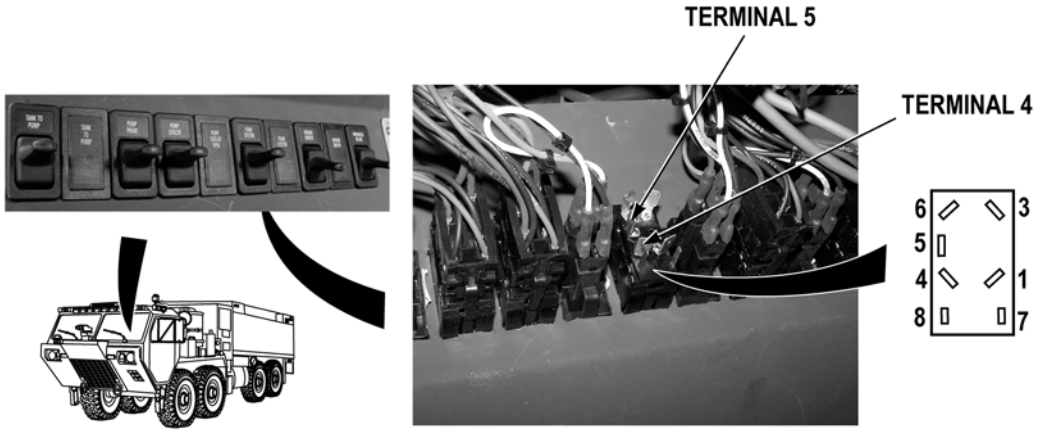
If eductor strainer is clogged or damaged, clean or replace strainer screen (WP 0181).

Step 13. Install eductor strainer screen and plug (WP 0181). Open foam system service valve (WP 0004). Start engine (TM 9-2320-279-10). Set up system to pump from onboard water tank (WP 0018). Put cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004). Operate bumper turret (WP 0026), under truck nozzles (WP 0027), or hose reel with manual metering valve (WP 0023). Check if foam is delivered when system is operated. Flush foam system (WP 0021).

a. If foam is delivered, problem has been corrected.

b. If foam is not delivered, replace eductor (WP 0175).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

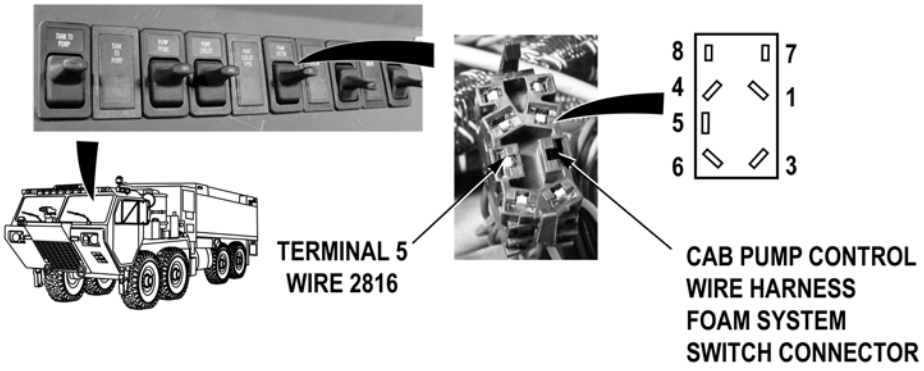
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Release FOAM SYSTEM switch (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness FOAM SYSTEM switch connector. While an assistant holds cab FOAM SYSTEM switch in off position, check for continuity across FOAM SYSTEM switch, from terminal 5 to terminal 4.

a. If there is continuity, repair wire 2831 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, replace cab FOAM SYSTEM switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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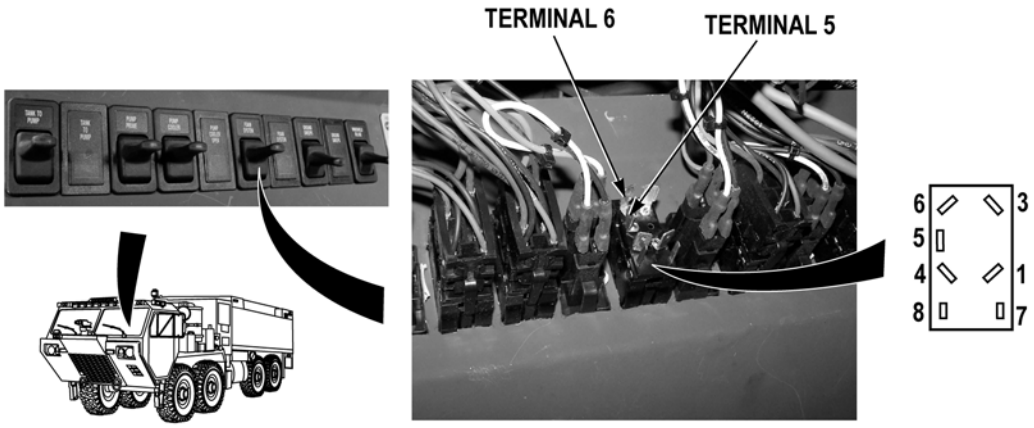
Step 15. Release cab FOAM SYSTEM switch (WP 0004). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness FOAM SYSTEM switch connector. With a test lead set, check for 22 to 28 VDC between cab pump control wire harness wire 2816 (red) at FOAM SYSTEM switch connector, terminal 5 and a known good ground.

If 22 to 28 VDC are not present, repair wire 2816 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

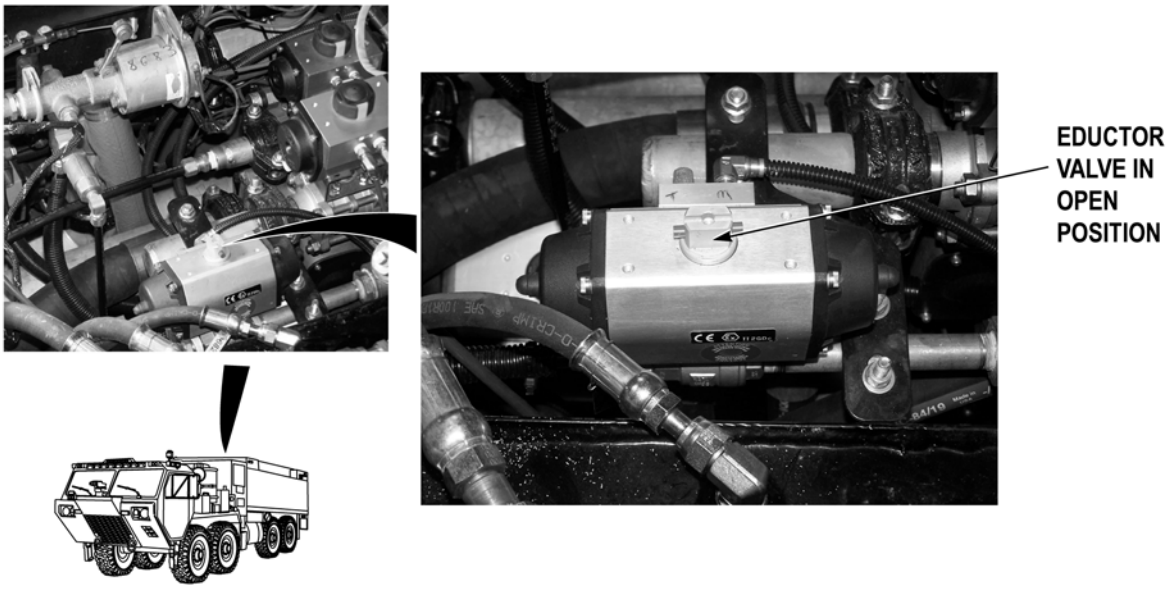
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Pull battery disconnect switch to off position (WP 0007). While an assistant holds cab FOAM SYSTEM switch in on position, check for continuity across FOAM SYSTEM switch, from terminal 5 to terminal 6.

a. If there is continuity, repair wire 2830 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

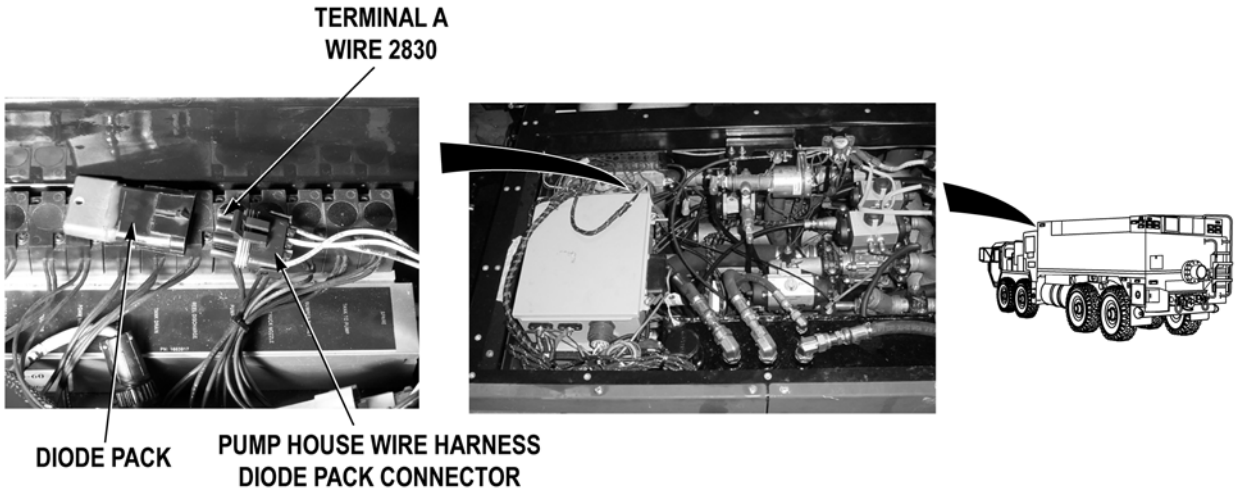
b. If there is no continuity, replace cab FOAM SYSTEM switch (WP 0197).



Step 17. Put pump operator's panel FOAM SYSTEM switch to OFF position (WP 0004) and release. While an assistant puts pump operator's panel FOAM FLUSH switch to ON position (WP 0004), check if eductor valve operates to open position.

If eductor valve does not operate to the open position, go to Step 20.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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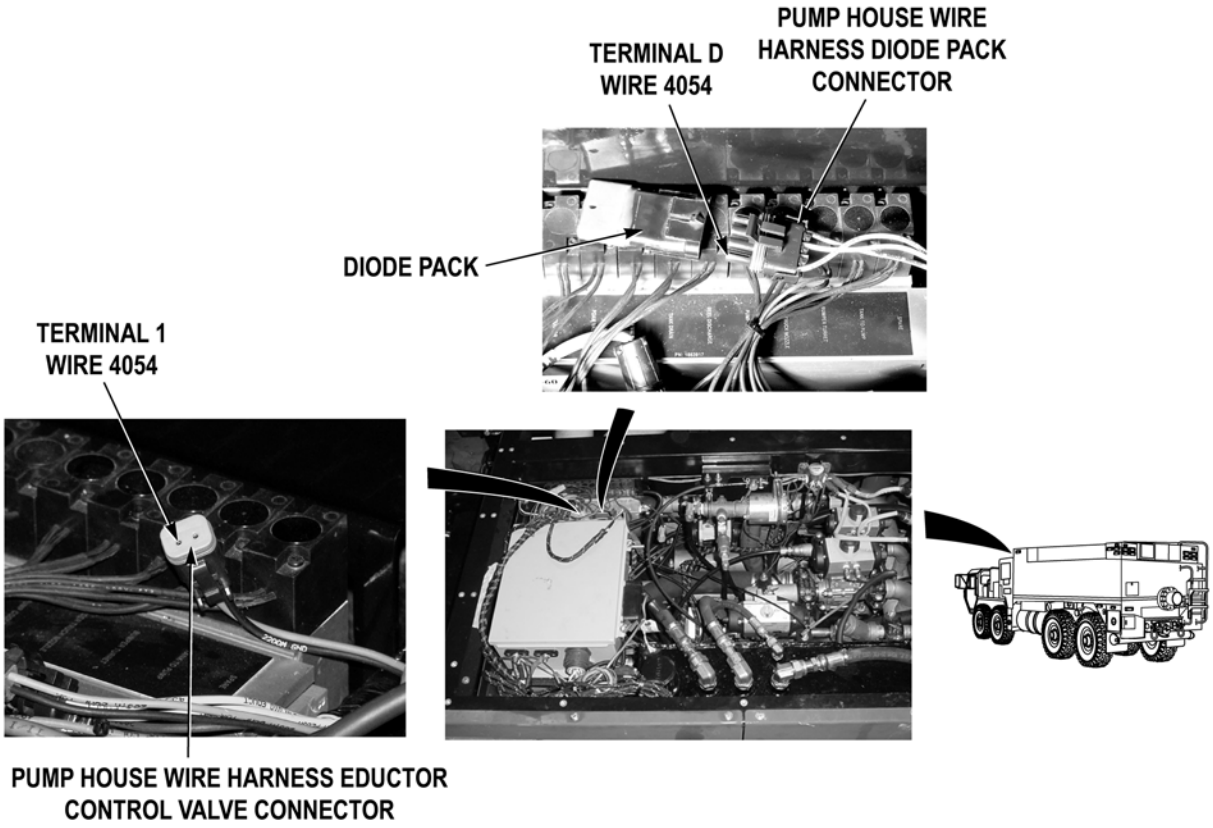
Step 18. Put FOAM FLUSH switch to OFF position (WP 0004). Disconnect diode pack from pump house wire harness diode pack connector (WP 0268). Put cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004) and release. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2830 (red) at diode pack connector, terminal A and a known good ground.

If 22 to 28 VDC are not present, repair wire 2830 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness eductor control valve connector. With a test lead set, check for continuity across wire 4054 (yellow) from pump house wire harness diode pack connector, terminal D to eductor control valve connector, terminal 1.

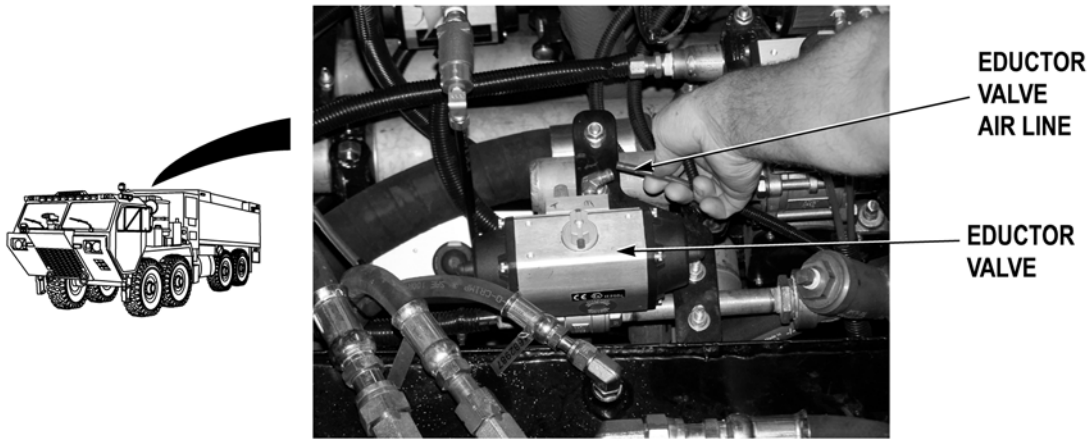
a. If there is continuity, replace diode pack (WP 0268).

b. If there is no continuity, repair wire 4054 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 20. Put FOAM FLUSH switch to OFF position (WP 0004). Check if air line from air control valve manifold to eductor valve is free from kinks and damage.

If air line is kinked or damaged, replace damaged air line (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

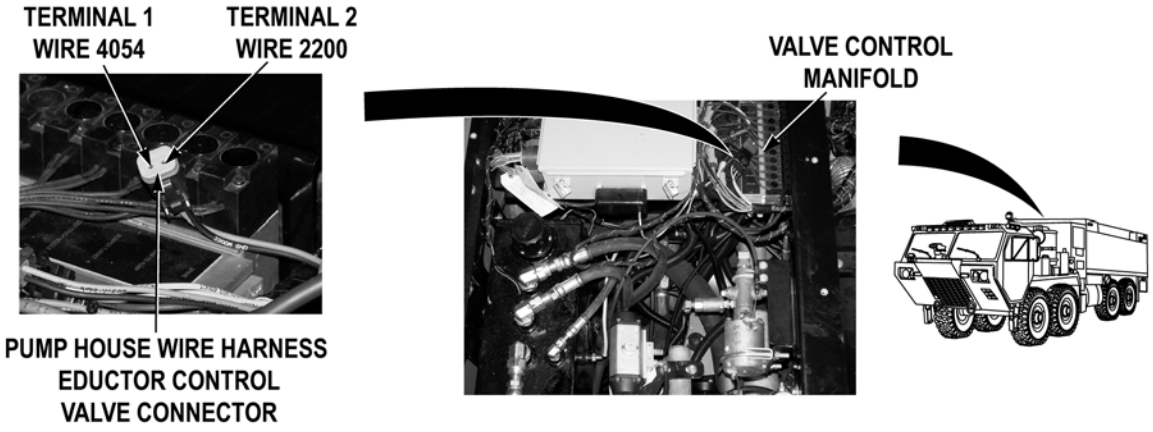
NOTE

Air pressure is checked by disconnecting air line at eductor valve and observing air pressure escaping from air line, when eductor control valve is activated. Air will escape from the blue air line when FOAM SYSTEM switch is positioned to the ON position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 21. Disconnect air line at eductor valve. While an assistant puts cab or pump operator's panel FOAM SYSTEM switch to on position (WP 0004), check if air pressure is present at eductor valve.

If there is air pressure, replace eductor valve (WP 0176).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 22. Connect air line at eductor valve. Disconnect pump house wire harness eductor control valve connector. Put cab or pump operator's panel FOAM SYSTEM switch to on position (WP 0004) and release. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4054 (yellow) at pump house wire harness eductor control valve connector, terminal 1 and a known good ground.

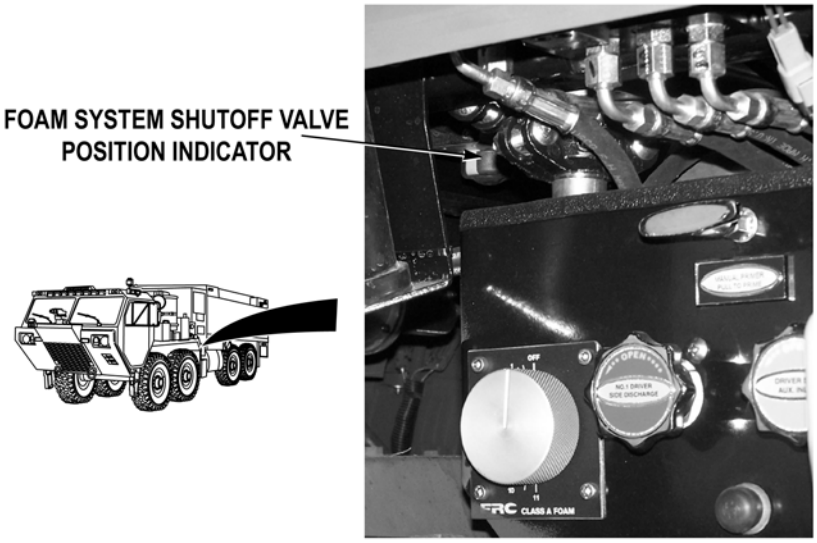
If 22 to 28 VDC are not present, repair wire 4054 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 23. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness eductor control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace eductor control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



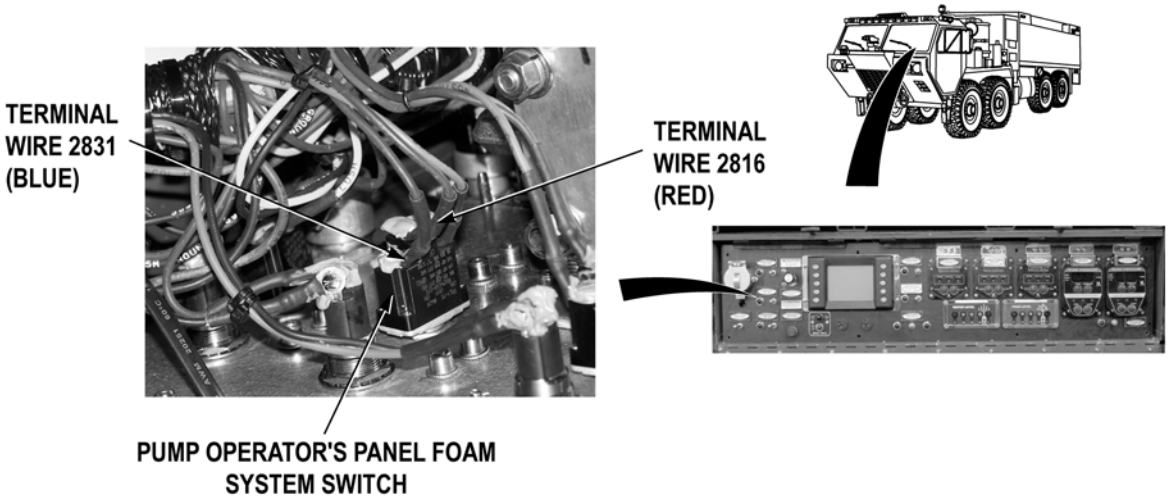
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

Step 24. Release pump operator's panel FOAM SYSTEM switch (WP 0004). While an assistant puts cab FOAM SYSTEM switch to off position (WP 0004), check if foam system shutoff valve operates to closed position.

If foam system shutoff valve does not operate to closed position, go to Step 28.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



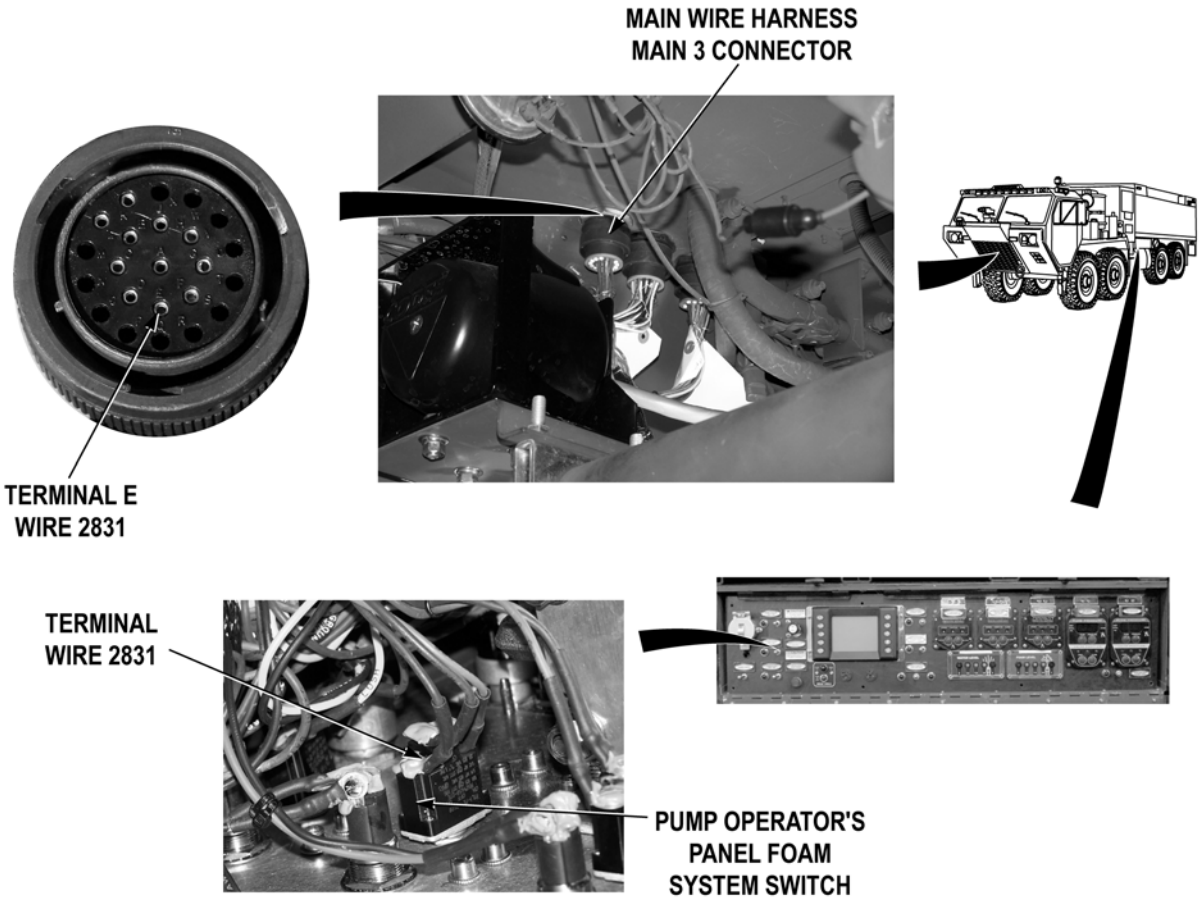
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 25. Push battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel FOAM SYSTEM switch, from terminal wire 2816 (red) to terminal wire 2831 (blue), while an assistant holds switch in OFF position.

If there is no continuity, replace pump operator's panel FOAM SYSTEM switch (WP 0215).

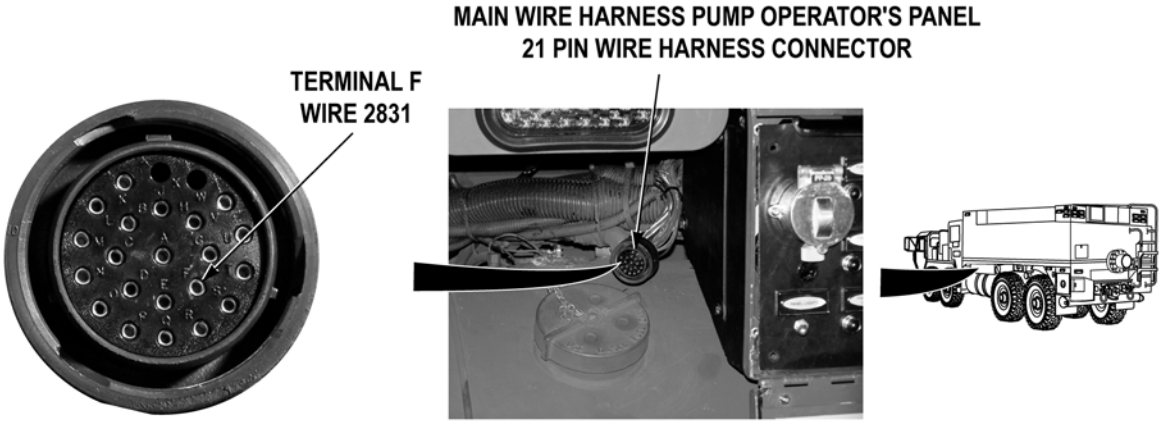
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 26. Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across wire 2831 (blue) from pump operator's panel FOAM SYSTEM switch terminal, to main wire harness main 3 connector, terminal E.

If there is continuity, repair wire 2831 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

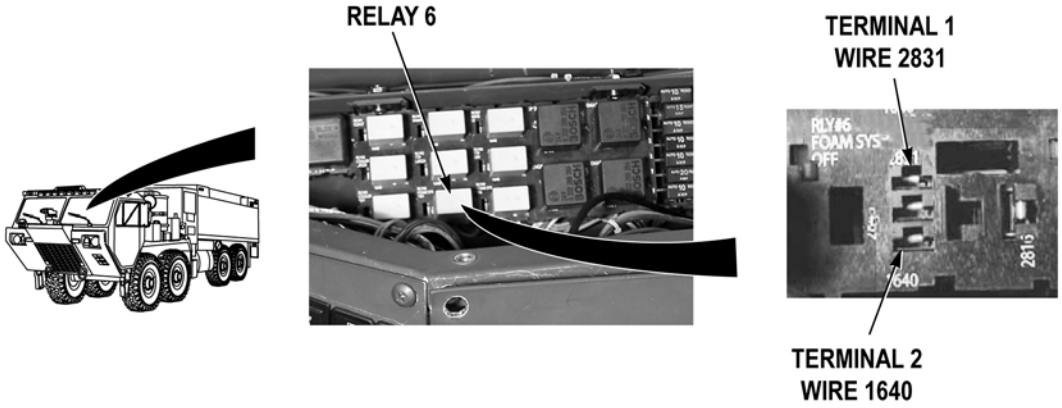


Step 27. Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for continuity across main wire harness wire 2831 (blue) from main wire harness pump operator's panel 21 pin wire harness connector, terminal F to main wire harness main 3 connector, terminal E.

a. If there is continuity, repair wire 2831 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 2831 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 28. Remove cab instrument panel A (WP 0203). Remove relay 6 (WP 0242). While an assistant puts cab FOAM SYSTEM switch to off position (WP 0004), with a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 2831 (blue) at relay 6 connector, terminal 1 and a known good ground.

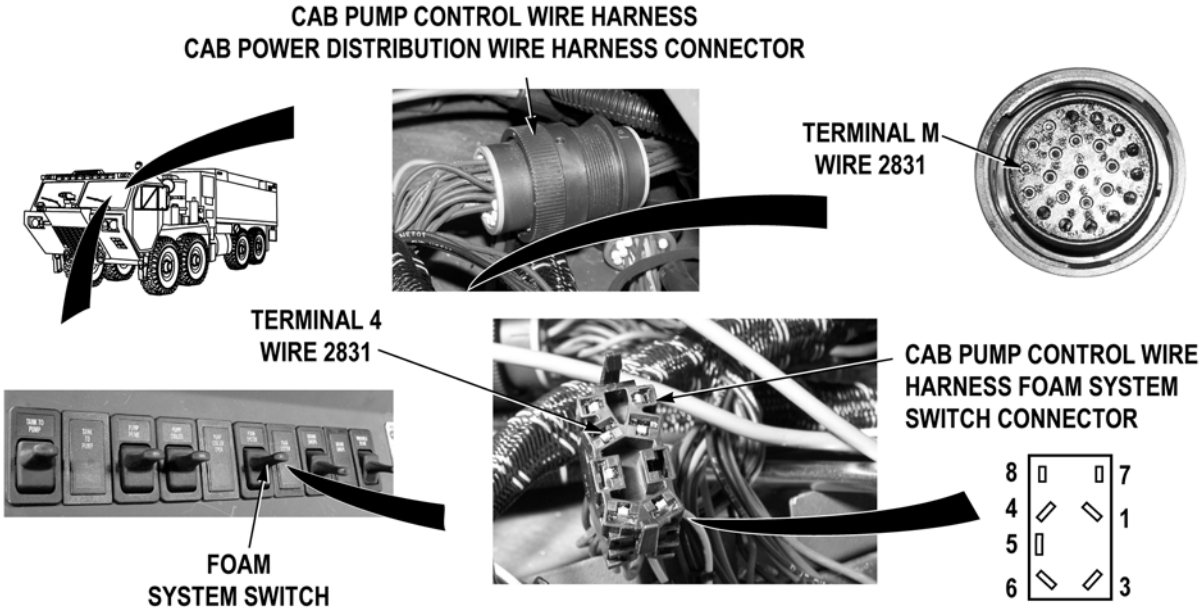
If 22 to 28 VDC are not present, go to Step 30.

Step 29. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across cab power distribution wire harness wire 1640 (black) from relay 6 connector, terminal 2 to a known good ground.

a. If there is continuity, replace relay 6 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

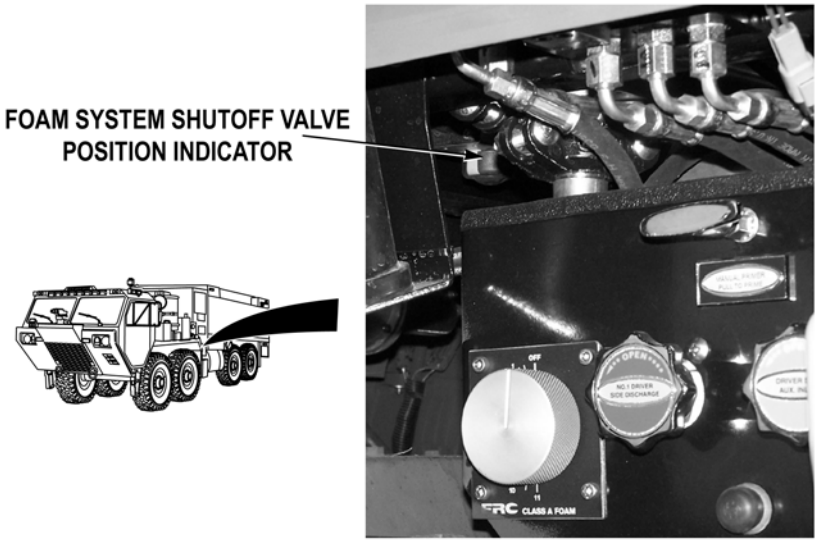


Step 30. Pull battery disconnect switch to off position (WP 0007). Disconnect cab pump control wire harness cab power distribution wire harness connector. Disconnect cab pump control wire harness FOAM SYSTEM switch connector. With a test lead set, check for continuity across pump control wire harness wire 2831 (blue) from cab pump control wire harness connector, terminal M to FOAM SYSTEM switch connector, terminal 4.

a. If there is continuity, repair wire 2831 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2831 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

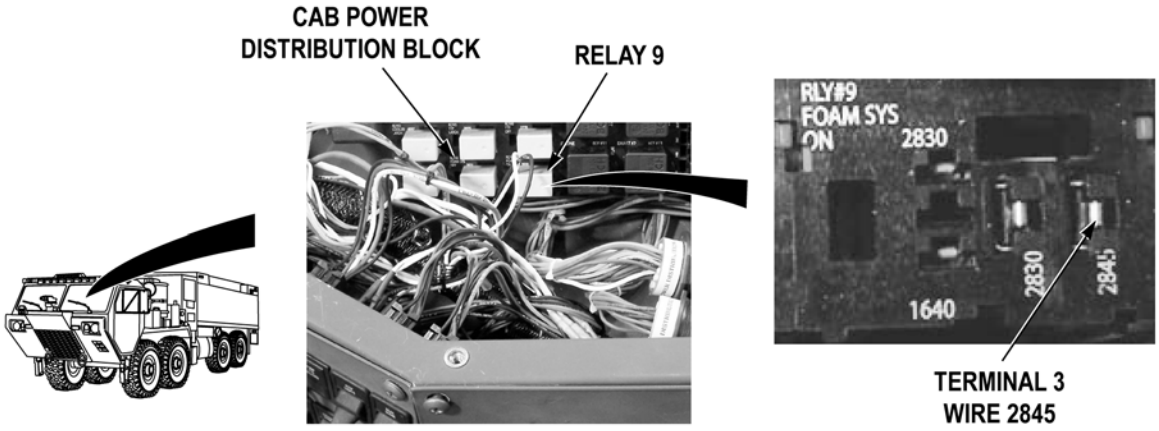
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 31. While an assistant puts cab FOAM SYSTEM switch to on position (WP 0004), check if foam system shutoff valve operates to open position.

If foam system shutoff valve does not operate to open position, go to Step 39.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



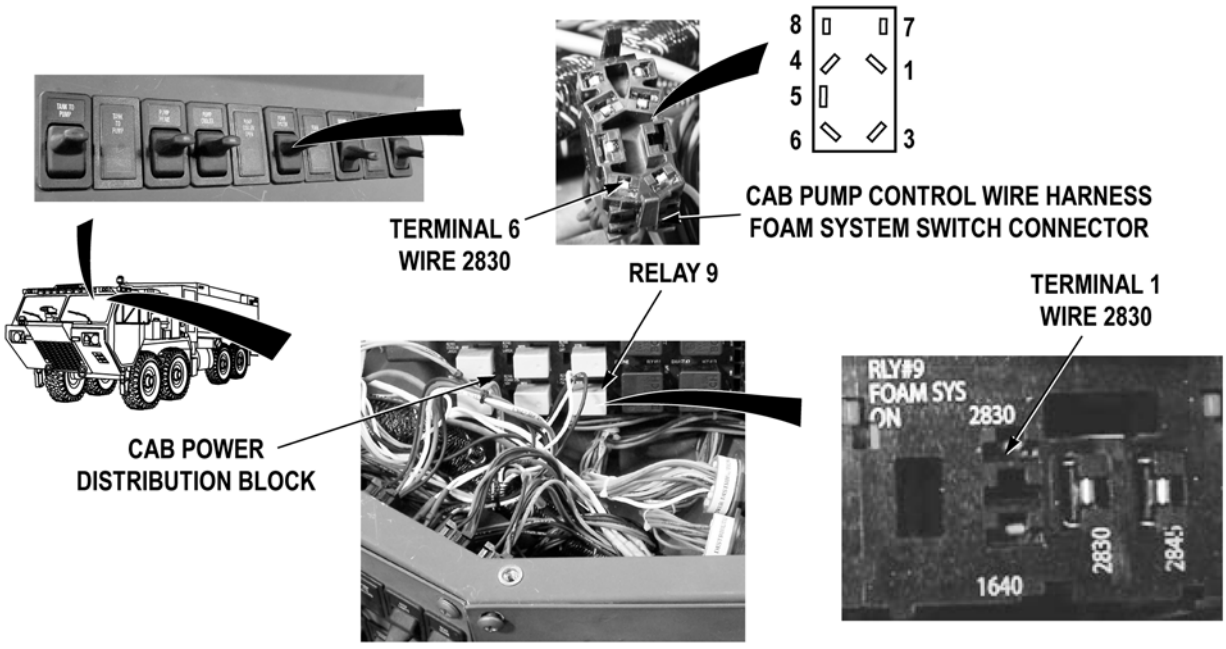
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 32. Put cab FOAM SYSTEM switch to off position (WP 0004) and release. Remove cab instrument panel A (WP 0203). Remove relay 9 from cab power distribution block (WP 0242). With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 2845 (white) at relay 9 connector, terminal 3 and a known good ground.

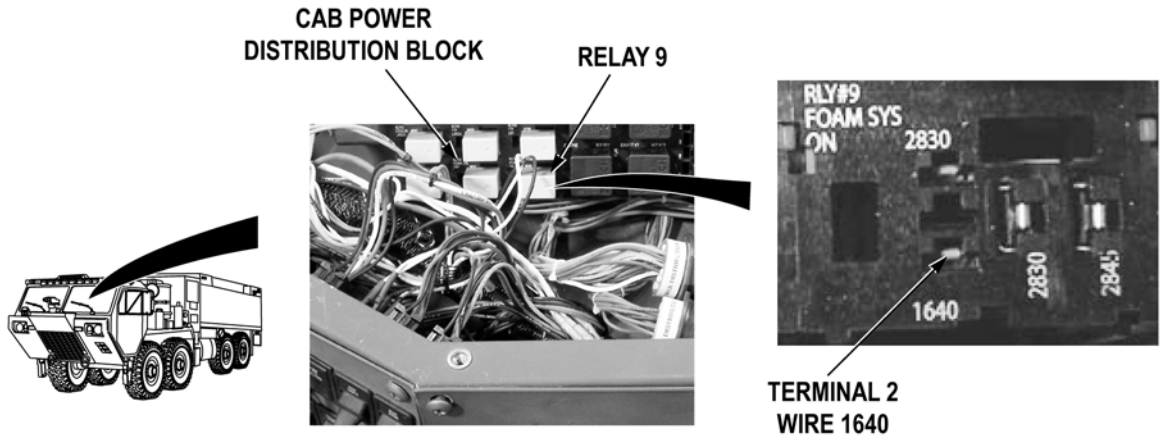
If 22 to 28 VDC are not present, go to Step 37.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 33. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2830 (red) from cab pump control wire harness FOAM SYSTEM switch connector, terminal 6 to cab power distribution wire harness relay 9 connector, terminal 1.

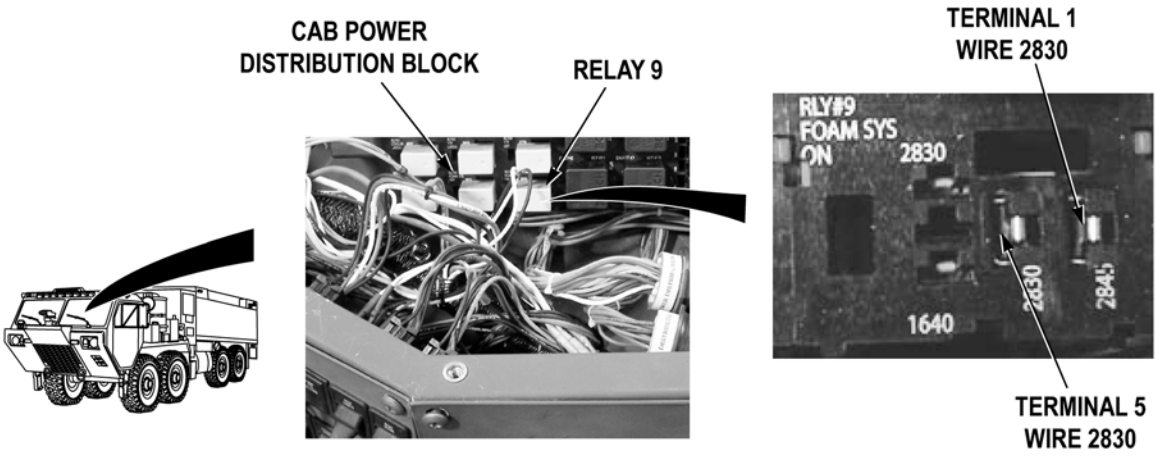
If there is no continuity, go to Step 36.



Step 34. With a test lead set, check for continuity across cab power distribution wire harness wire 1640 (black) from relay 9 connector, terminal 2 to a known good ground.

If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

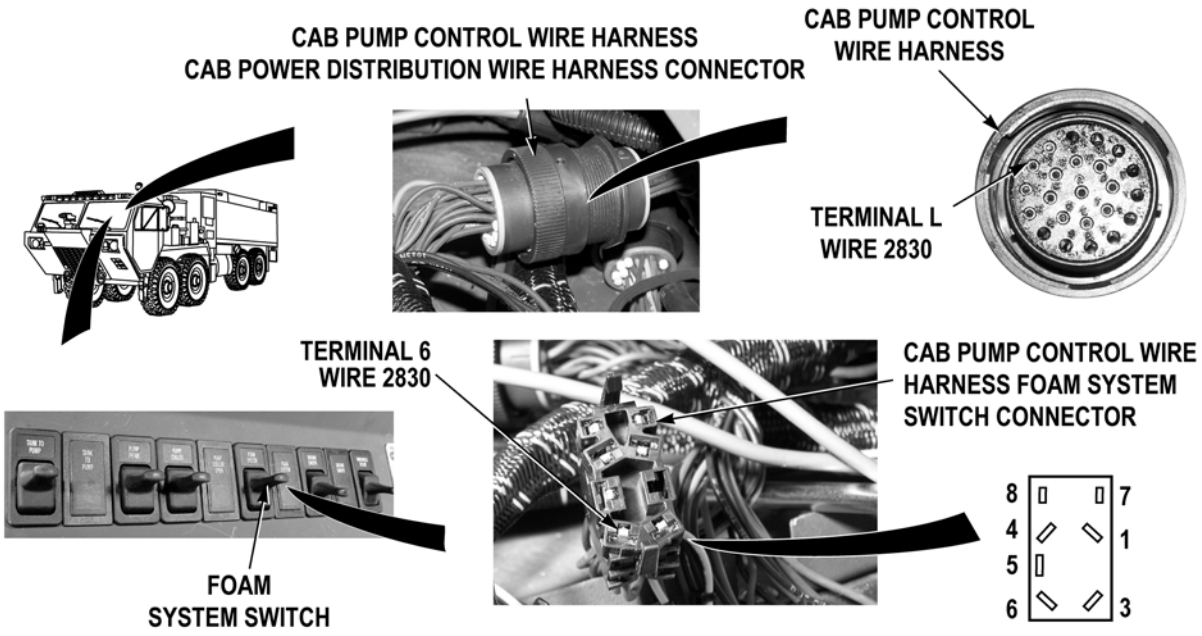


Step 35. With a test lead set, check for continuity across cab power distribution wire harness wire 2830 (red) from relay 9 connector, terminal 1 to relay 9 connector, terminal 5.

a. If there is continuity, replace relay 9 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

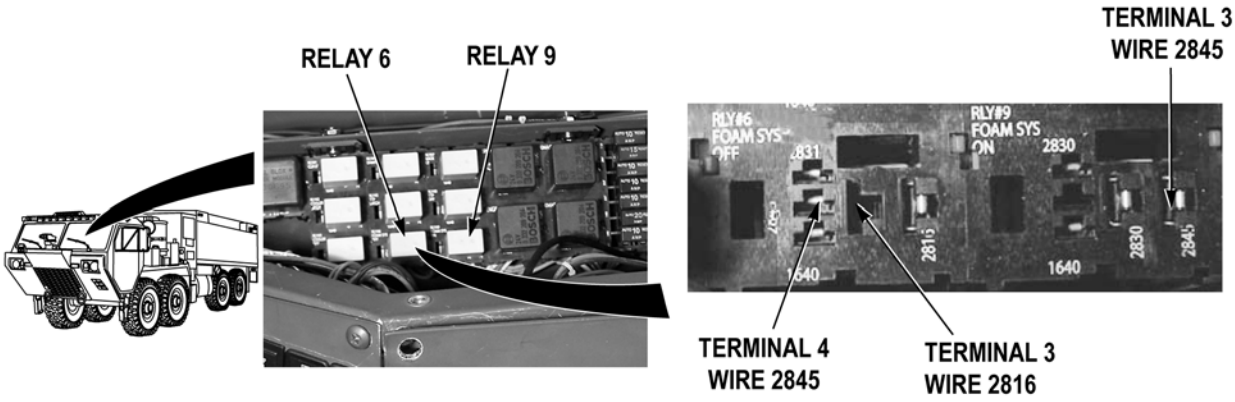
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 36. Disconnect cab power distribution wire harness cab pump control wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 2830 (red) from cab pump control wire harness FOAM SYSTEM switch connector, terminal 6 to cab pump control wire harness connector, terminal L.

a. If there is continuity, repair wire 2830 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2830 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 37. Remove relay 6 (WP 0242). With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 2816 (red) at relay 6 connector, terminal 3 and a known good ground.

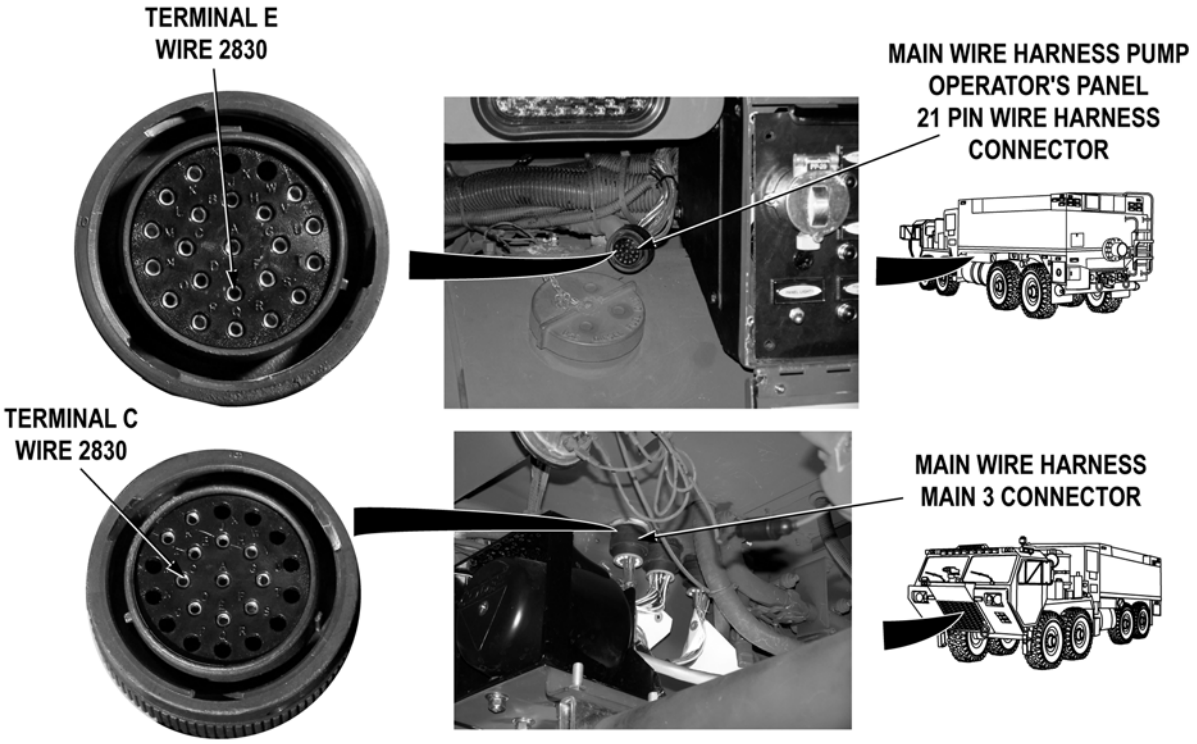
If 22 to 28 VDC are not present, replace cab power distribution wire harness and block (WP 0280).

Step 38. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across cab power distribution wire harness wire 2845 (white) from relay 6 connector, terminal 4 to relay 9 connector, terminal 3.

a. If there is continuity, replace relay 6 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

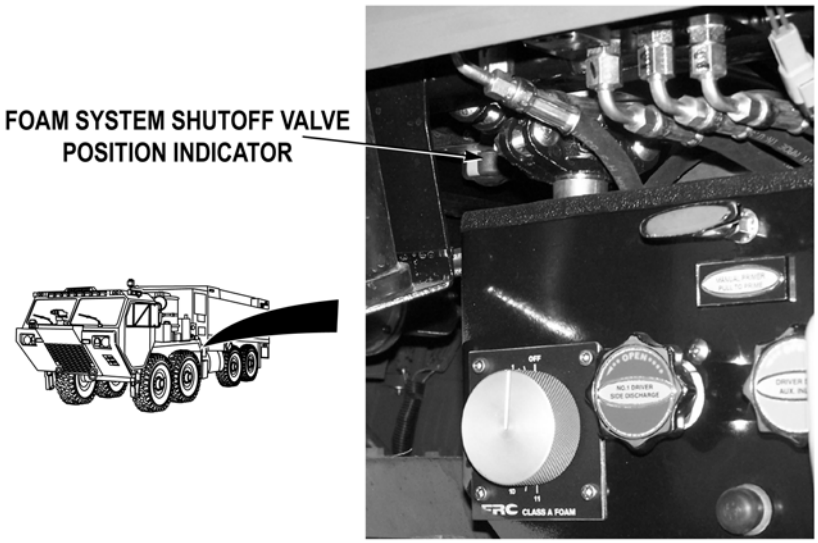
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 39. Release FOAM SYSTEM switch (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2830 (red) from main wire harness pump operator's panel 21 pin wire harness connector terminal E to main wire harness main 3 connector, terminal C.

a. If there is continuity, repair wire 2830 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2830 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



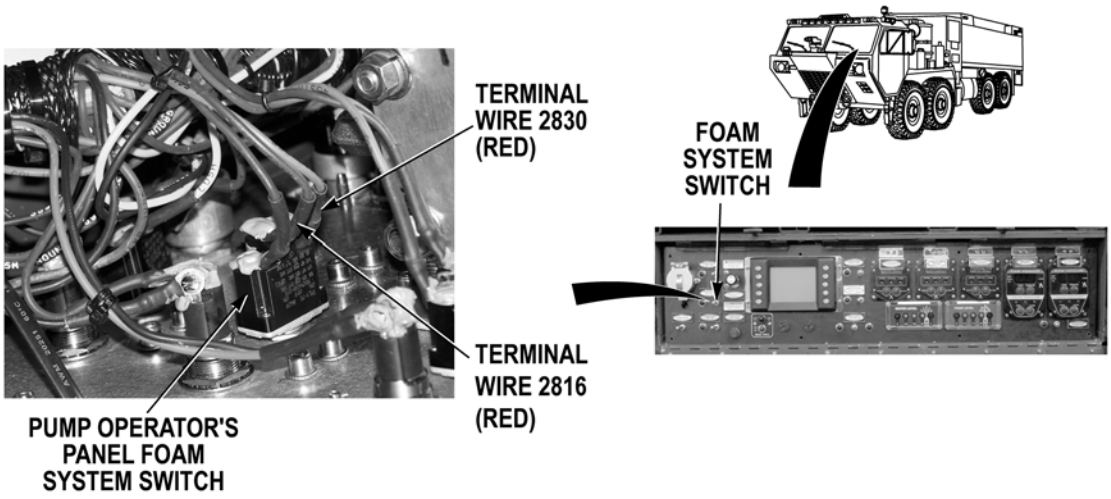
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

Step 40. Put pump operator's panel FOAM SYSTEM switch to OFF position (WP 0004) and release. While an assistant puts cab FOAM SYSTEM switch to on position (WP 0004), check if foam system shutoff valve operates to open position.

If foam system shutoff valve does not operate to open position, go to Step 46.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

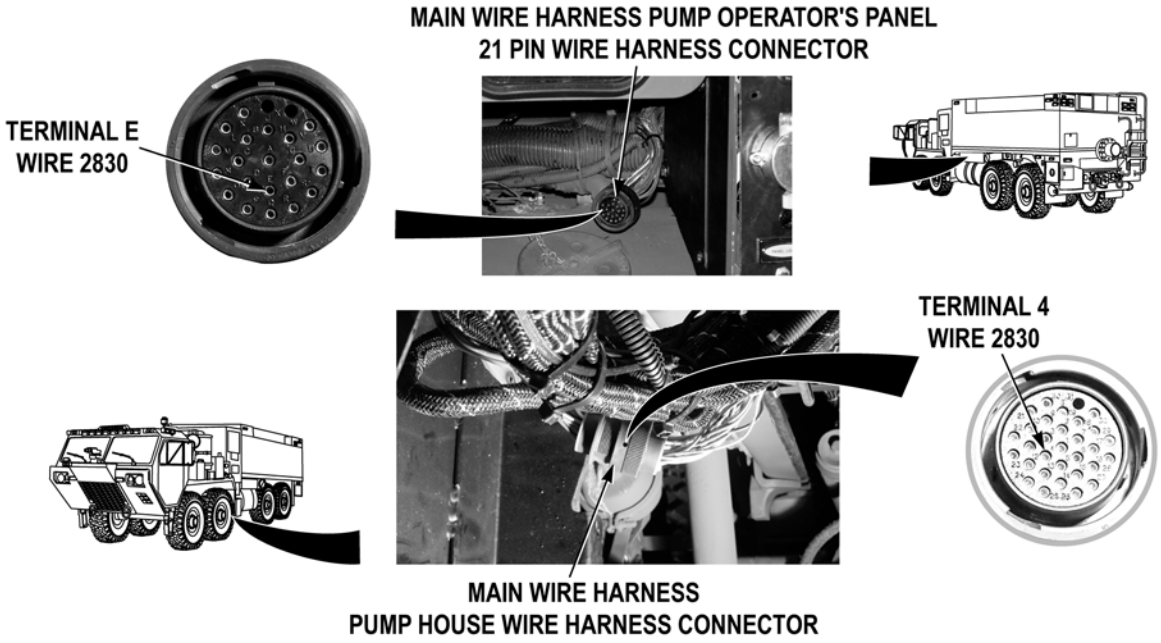
Step 41. Release FOAM SYSTEM switch (WP 0004). Open pump operator's panel (WP 0205). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2816 (red) at FOAM SYSTEM switch terminal and a known good ground.

If 22 to 28 VDC are not present, go to Step 44.

Step 42. Pull battery disconnect switch to off position (WP 0007). While an assistant holds pump operator's panel FOAM SYSTEM switch in on position, check for continuity across pump operator's panel FOAM SYSTEM switch from terminal wire 2816 (red) to terminal wire 2830 (red).

If there is no continuity, replace pump operator's panel FOAM SYSTEM switch (WP 0215).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

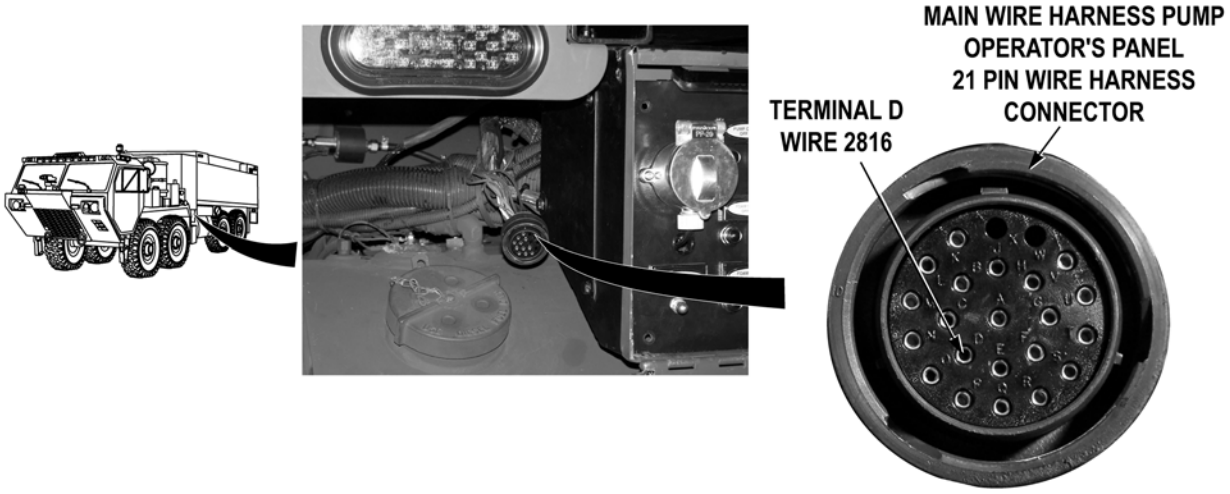


Step 43. Disconnect main wire harness pump operator's panel 21 pin wire harness connector. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across main wire harness wire 2830 from main wire harness pump operator's panel 21 pin wire harness connector, terminal E to main wire harness pump house wire harness connector, terminal 4.

a. If there is continuity, repair wire 2830 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 2830 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



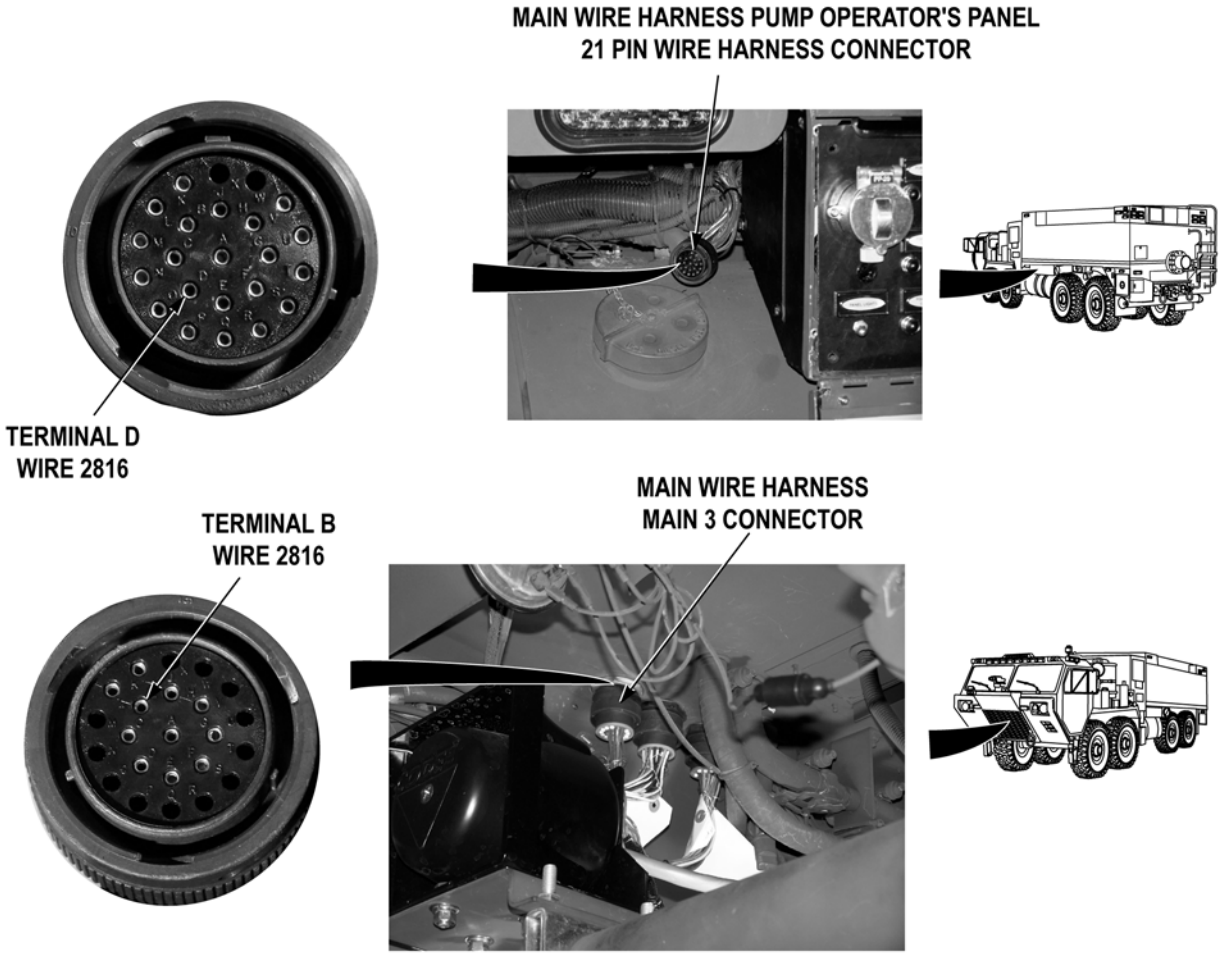
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 44. Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness pump operator's panel 21 pin wire harness wire 2816, terminal D and a known good ground.

If 22 to 28 VDC are present, repair wire 2816 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

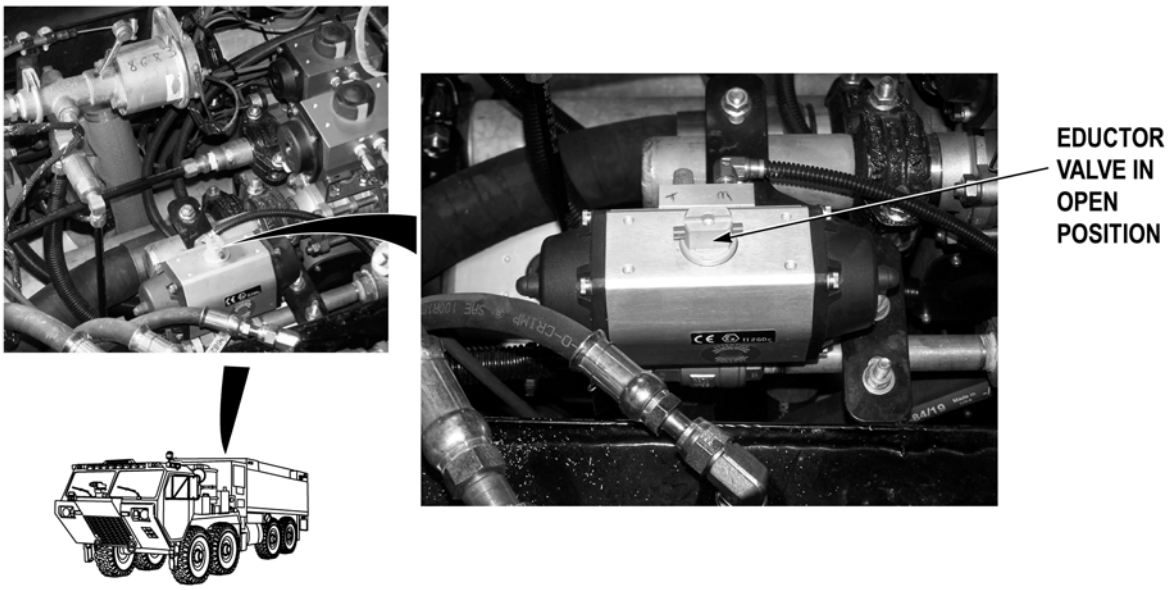


Step 45. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2816 (red) from main 3 connector, terminal B to main wire harness pump operator's panel 21 wire harness pin connector, terminal D.

a. If there is continuity, repair wire 2816 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2816 main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

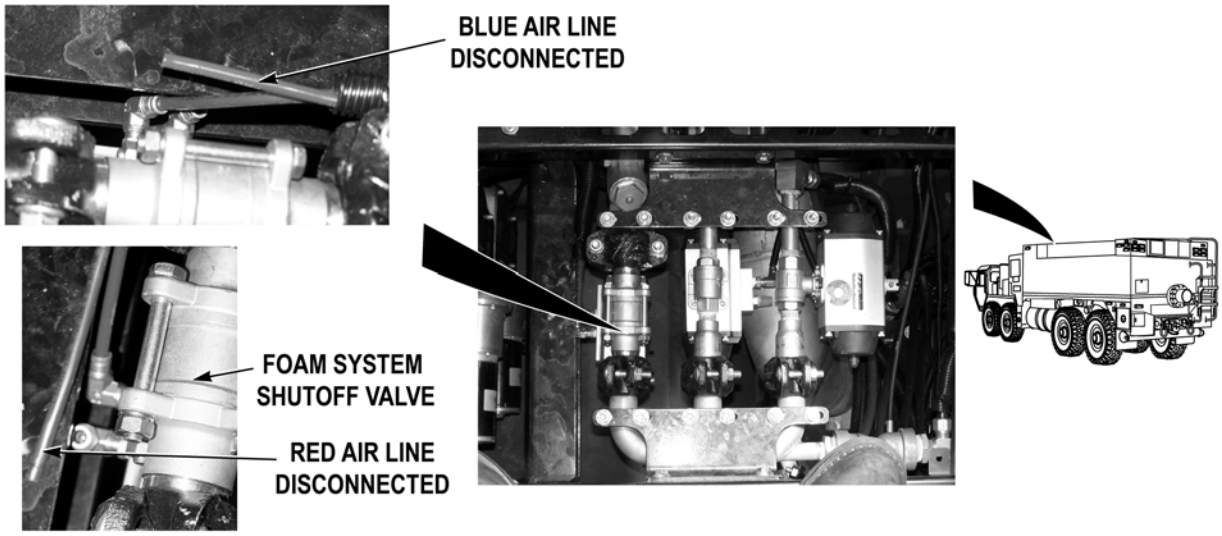
Step 46. Put cab FOAM SYSTEM switch to off position (WP 0004) and release. Remove pump house panel K (WP 0341). While an assistant puts cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004), check if eductor valve operates to open position.

If eductor valve does not operate to open position, go to Step 51.

Step 47. Put cab or pump operator's panel FOAM SYSTEM switch to OFF position (WP 0004) and release. Check if air lines from air control valve manifold to foam system shutoff valve are free from kinks and damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

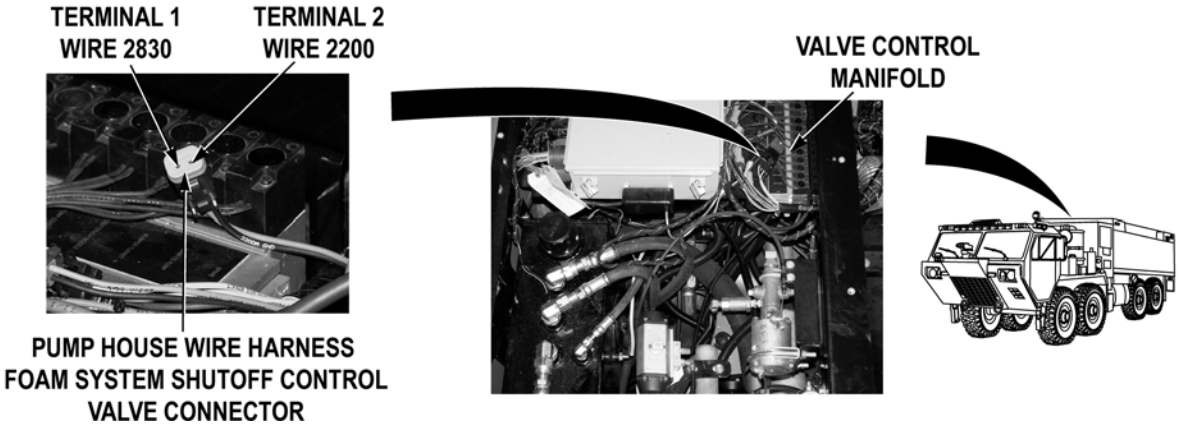
NOTE

Air pressure is checked by disconnecting air lines at foam system shutoff valve and observing air pressure escaping from air line, when foam system shutoff control valve is activated. Air will escape from the blue air line when FOAM SYSTEM switch is positioned to the on position, and escape from the red air line when the FOAM SYSTEM switch is positioned to the off position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 48. Remove hose reel (WP 0246). Disconnect air lines at foam system shutoff valve (WP 0174). While an assistant puts cab or pump operator's panel FOAM SYSTEM switch to ON and OFF positions (WP 0004), check if air pressure is present at foam system shutoff valve.

If there is air pressure, replace foam system shutoff valve (WP 0174).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 49. Connect air lines at foam system shutoff valve. Disconnect pump house wire harness foam system shutoff control valve connector. Put cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004) and release. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2830 (red) at pump house wire harness foam system shutoff control valve connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, repair wire 2830 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 50. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness foam system shutoff control valve connector, terminal 2 to a known good ground.

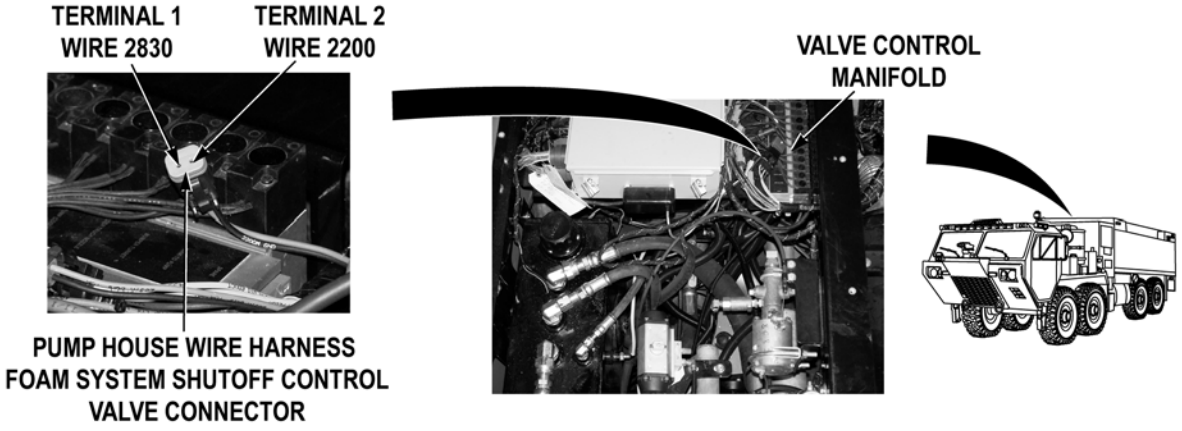
a. If there is continuity, replace foam system shutoff control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 51. Check if cab or pump operator's panel FOAM SYSTEM indicator is illuminated (WP 0004).

If indicator is not illuminated, go to Step 55.



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

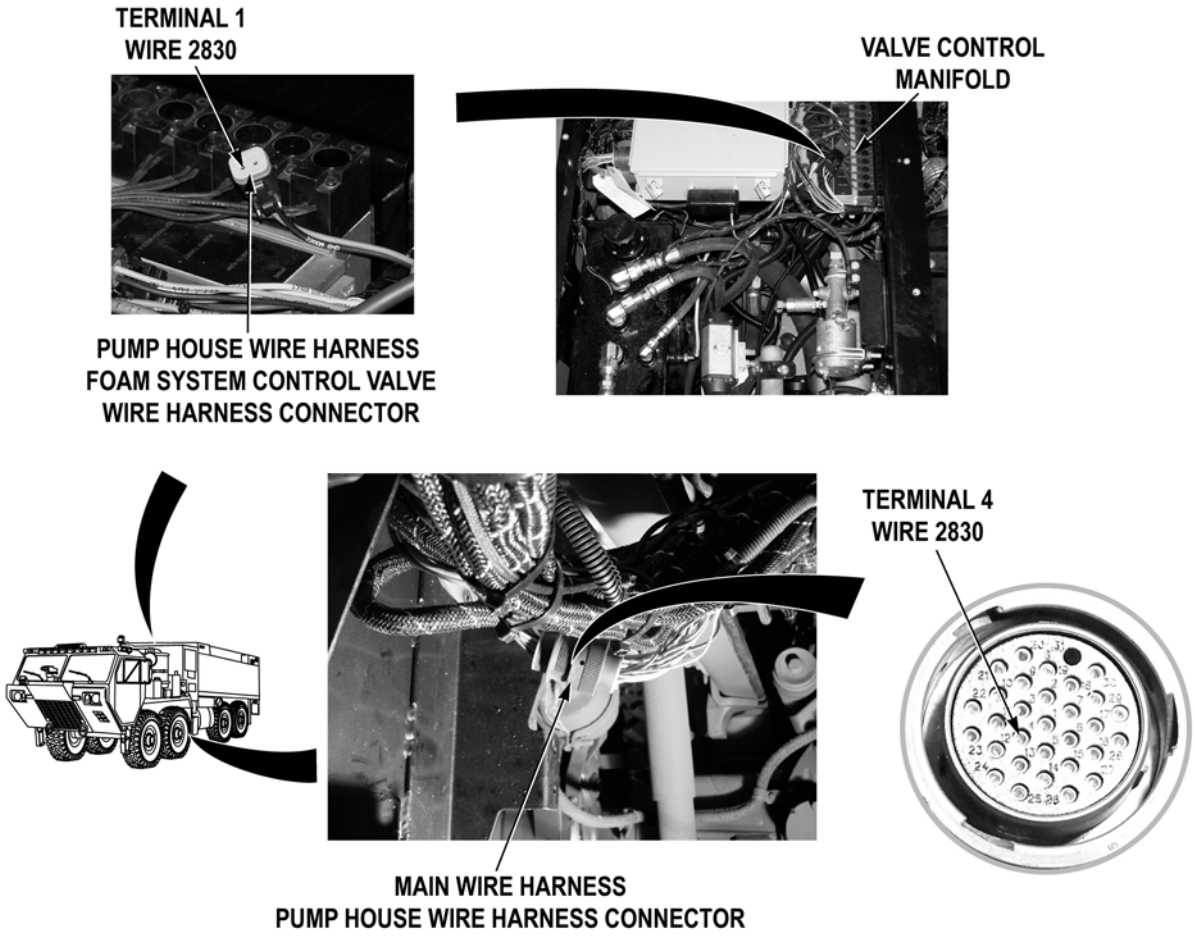
Step 52. Disconnect pump house wire harness foam system shutoff control valve connector. Put cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004) and release. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2830 (red) at pump house wire harness foam system shutoff control valve connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, go to Step 54.

Step 53. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness foam system shutoff control valve connector, terminal 2 to a known good ground.

If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 54. Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 2830 (red) from main wire harness pump house wire harness connector, terminal 4 to pump house wire harness foam system shutoff control valve connector, terminal 1.

a. If there is continuity, repair wire 2830 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 2830 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

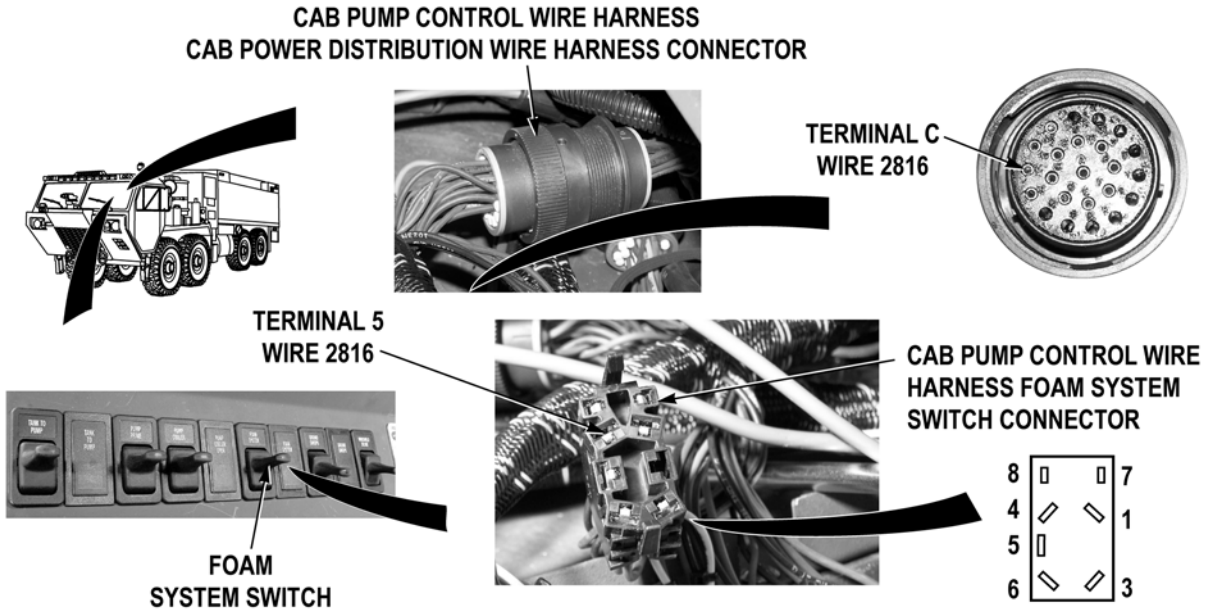
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 55. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 15 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 15 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 56. Install circuit breaker FS 15 (WP 0240). Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control harness wire 2816 (red) from cab pump control wire harness FOAM SYSTEM switch connector, terminal 5 to cab pump control wire harness connector, terminal C.

a. If there is continuity, repair wire 2816 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2816 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM NOT DELIVERED FROM BUMPER TURRET

INITIAL SETUP:

Tools and Special Tools
Test Lead Set (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

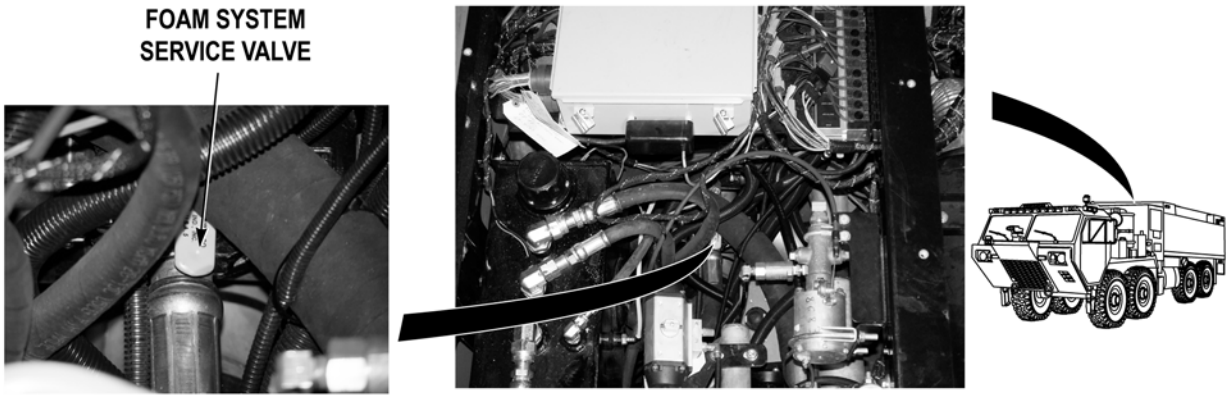
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0009
WP 0056

References (continued)
WP 0062
WP 0171
WP 0246
WP 0270
WP 0303
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

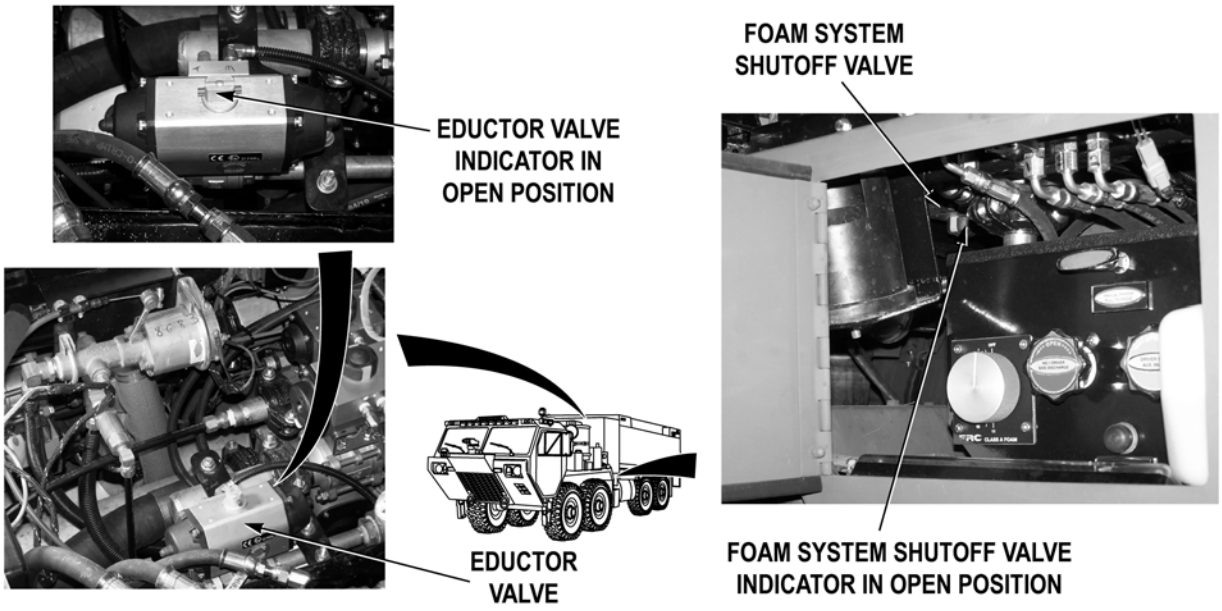
FOAM NOT DELIVERED FROM BUMPER TURRET



Step 1. Remove pump house panel K (WP 0341). Check if foam system service valve is in open position.

If foam system service valve is not in open position, position valve to open position (WP 0004).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



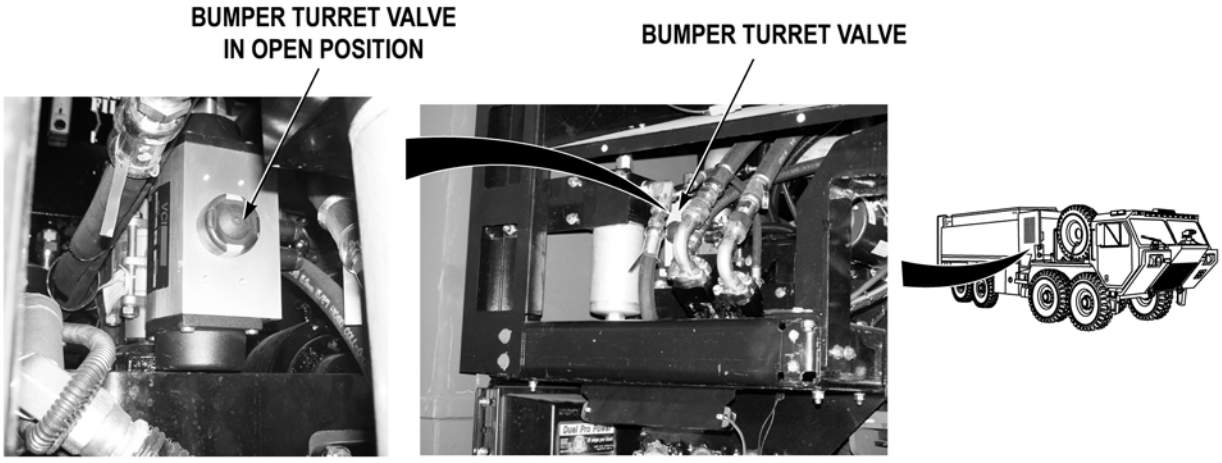
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 2. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Open pump house controls access door (WP 0009). While an assistant puts cab or pump operator's panel FOAM SYSTEM switch to on and off positions (WP 0004), check if foam system shutoff valve and eductor valve operate to open and closed position.

If foam system shutoff valve or eductor valve do not operate to open or closed position, troubleshoot Foam Not Delivered From All Systems (Bumper Turret, Under Truck Nozzles, and Manual Metering Controls) or System Does Not Shut Off (WP 0056).

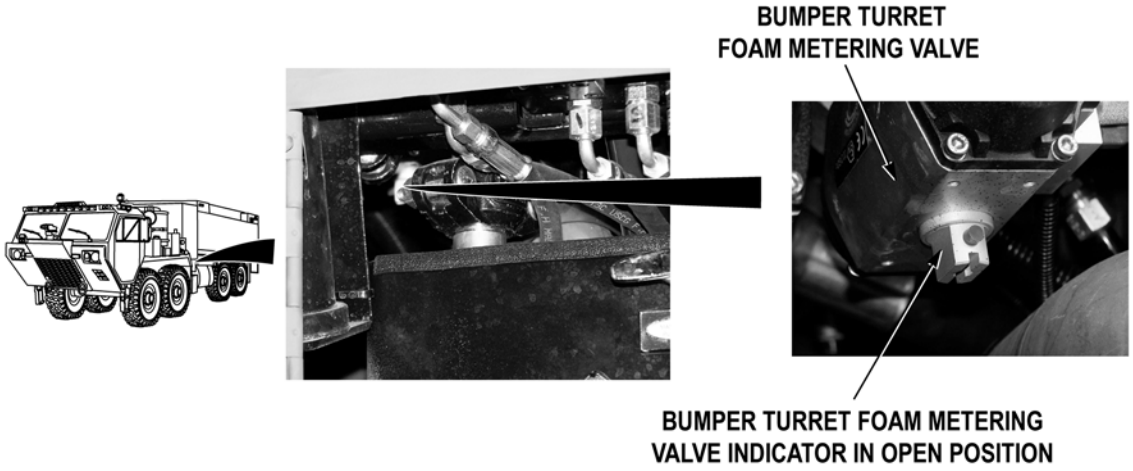
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Remove pump house panel H (WP 0341). Put FOAM SYSTEM switch to OFF position (WP 0004). Put bumper turret POWER switch to | (on) position (WP 0004). While an assistant pushes and holds bumper turret control agent discharge button (WP 0004), check if bumper turret valve operates to open position.

If bumper turret valve does not operate to open position, troubleshoot Bumper Turret Does Not Operate Properly When Selected (WP 0062).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



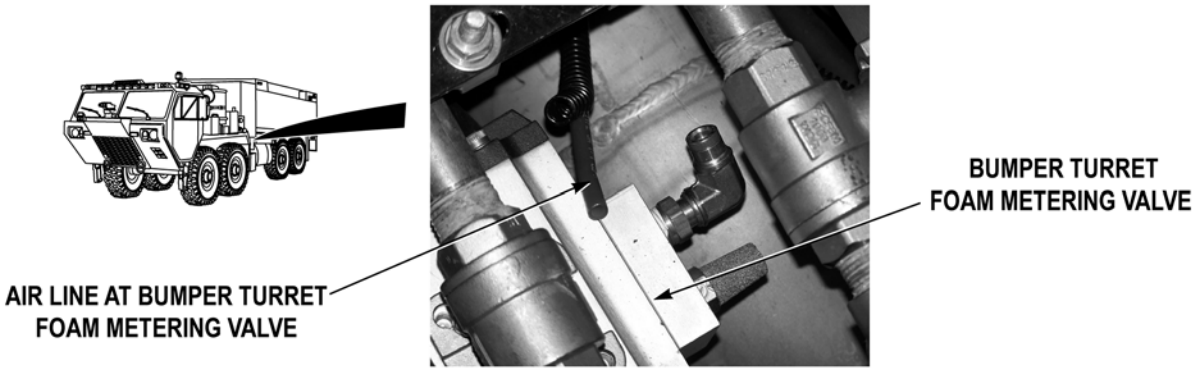
Step 4. Put cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004). Check if bumper turret foam metering valve operates to open position.

If bumper turret foam metering valve operates to open position, remove and clean or replace bumper turret foam metering valve orifice/restrictor (WP 0171).

Step 5. Release bumper turret control agent discharge button (WP 0004). Inspect air line from air control valve manifold to bumper turret foam metering valve for kinks and/or damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

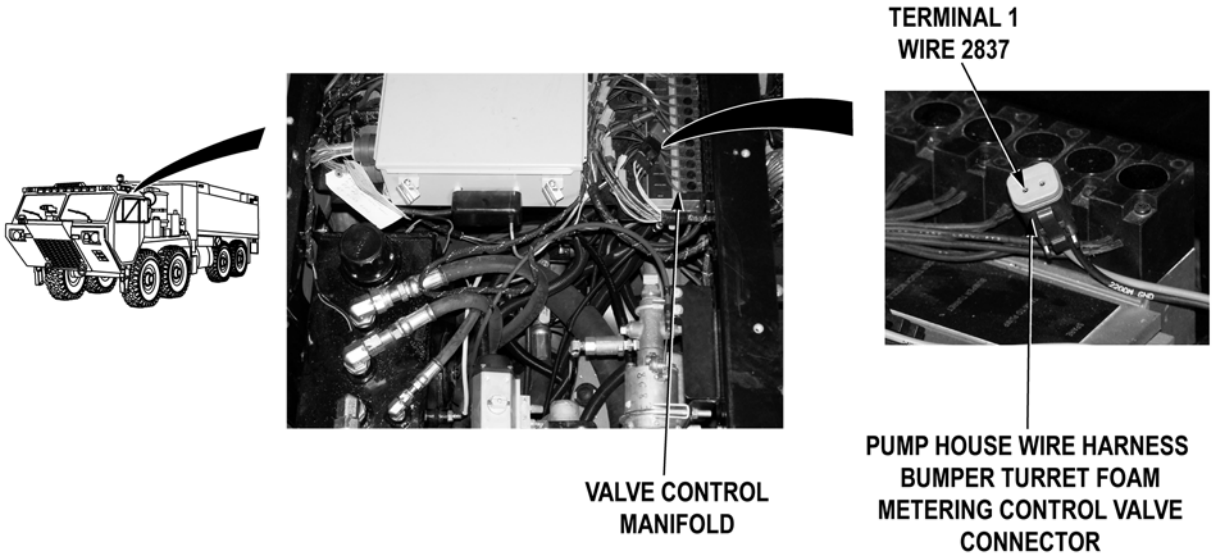
NOTE

Air pressure is checked by disconnecting air line at bumper turret foam metering valve and observing air pressure escaping from air line, when bumper turret foam metering control valve is activated. Air will escape from blue air line when bumper turret discharge switch is pressed. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 6. Remove hose reel (WP 0246). Disconnect air line at bumper turret foam metering valve. While an assistant pushes and holds bumper turret control agent discharge button (WP 0004), check if air pressure is present at bumper turret foam metering valve.

If there is air pressure, replace bumper turret foam metering valve (WP 0171).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



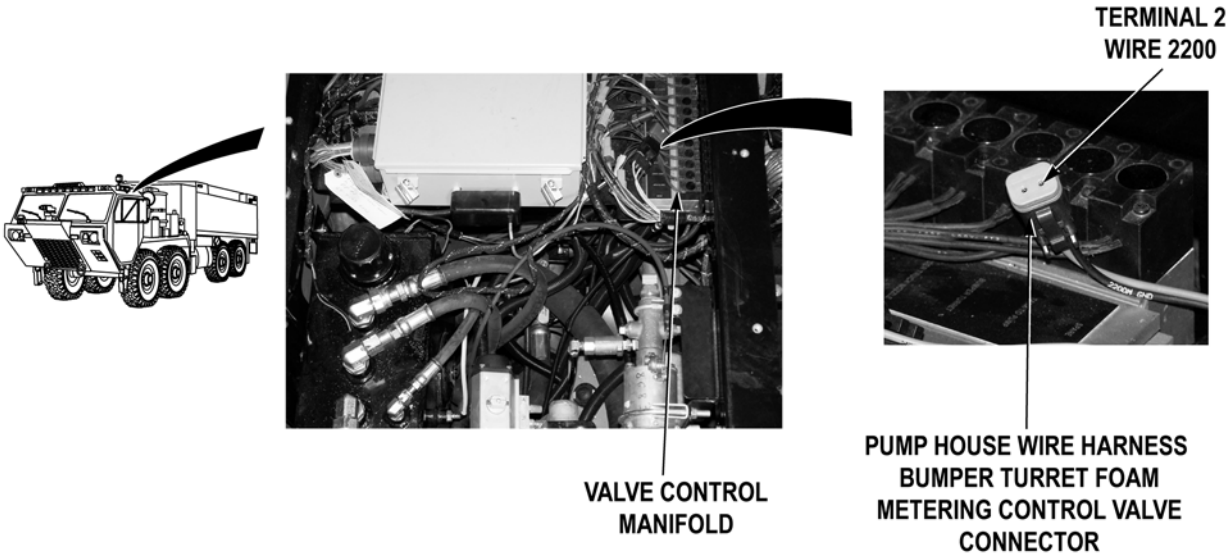
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 7. Release bumper turret control agent discharge button (WP 0004). Connect air line at bumper turret foam metering valve. Disconnect pump house wire harness bumper turret foam metering control valve connector. While an assistant pushes and holds bumper turret discharge button (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2837 (gray) at bumper turret foam metering control valve connector, terminal 1, and a known good ground.

If 22 to 28 VDC are not present, repair wire 2837 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Release bumper turret control agent discharge button (WP 0004). Put bumper turret power switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness bumper turret foam metering control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace bumper turret foam metering control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM NOT DELIVERED FROM UNDER TRUCK NOZZLES

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

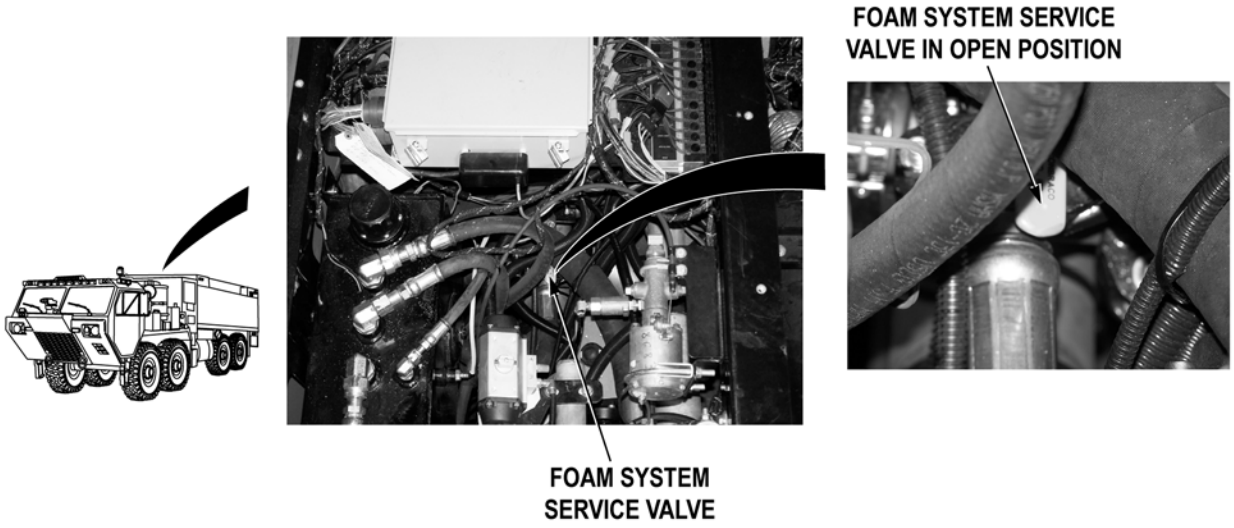
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0056
WP 0075

References (continued)
WP 0172
WP 0246
WP 0270
WP 0303
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

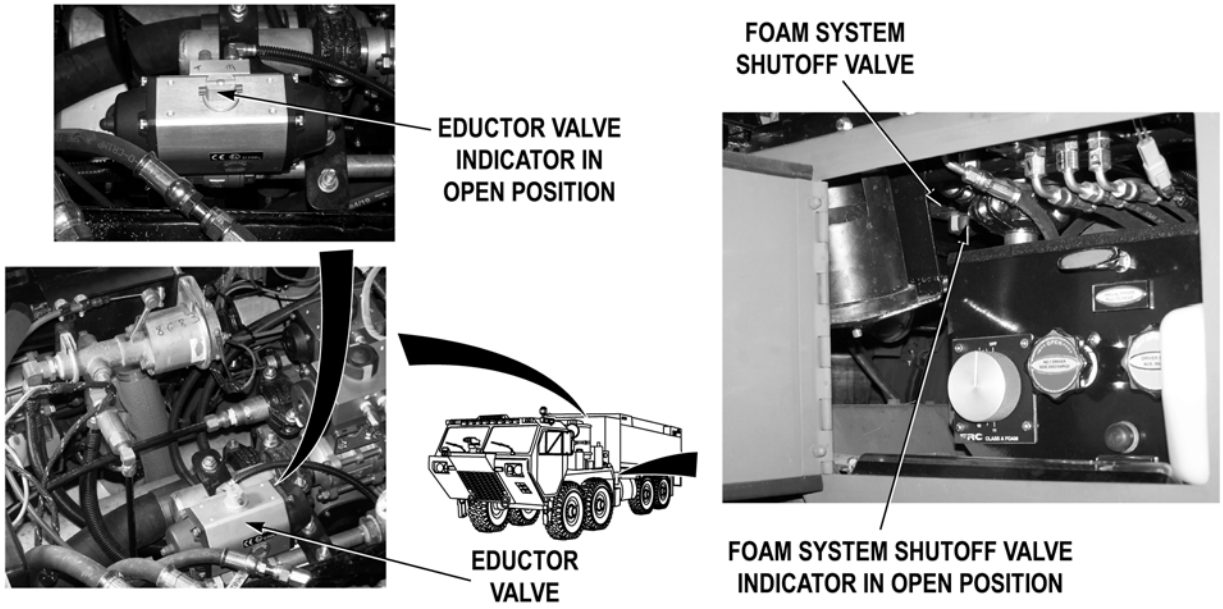
FOAM NOT DELIVERED FROM UNDER TRUCK NOZZLES



Step 1. Remove pump house panel K (WP 0341). Check if foam system service valve is in open position.

If foam system service valve is not in open position, put valve to open position (WP 0004).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



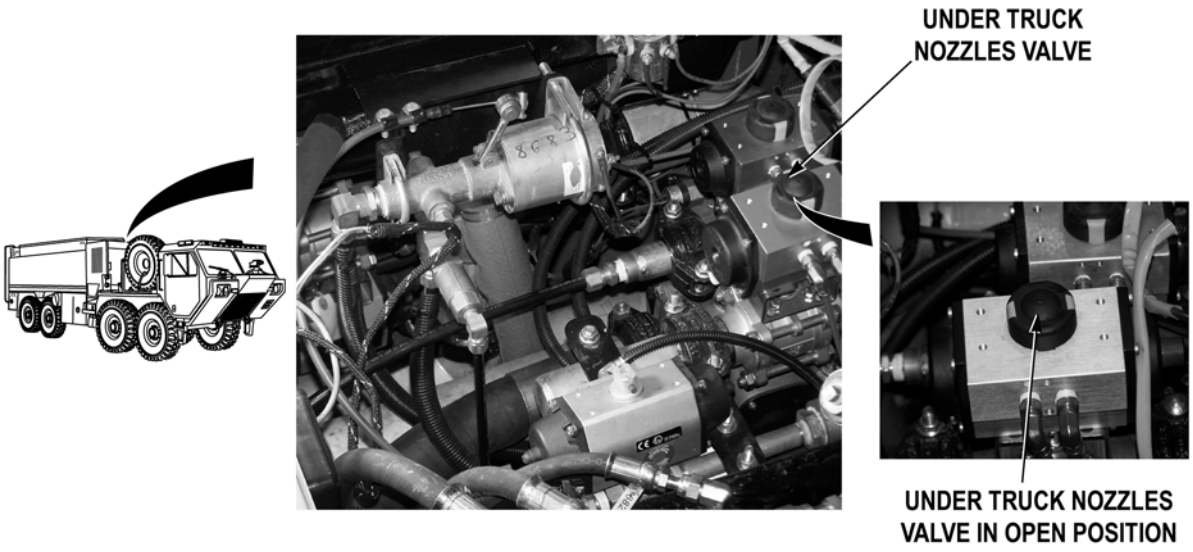
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 2. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Open pump house controls access door (WP 0008). While an assistant puts cab FOAM SYSTEM switch to on position (WP 0004), check if foam system shutoff valve and eductor valve operate to open position.

If foam system shutoff valve or eductor valve do not operate to open position, troubleshoot Foam Not Delivered From All Systems (Bumper Turret, Under Truck Nozzles, and Manual Metering Controls) or System Does Not Shut Off (WP 0056).

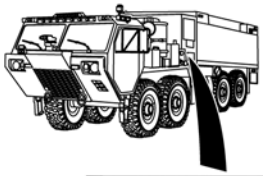
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

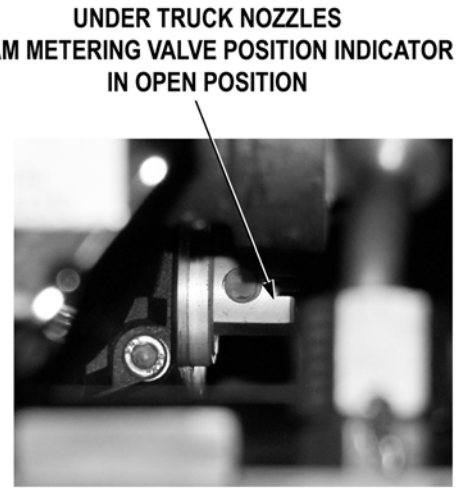


Step 3. Put cab FOAM SYSTEM switch to off position (WP 0004). While an assistant puts UNDER TRUCK NOZZLES switch to on position (WP 0004), check if under truck nozzles valve operates to open position.

If under truck nozzles valve does not operate to open position, troubleshoot Under Truck Nozzles Do Not Operate When Selected (WP 0075).

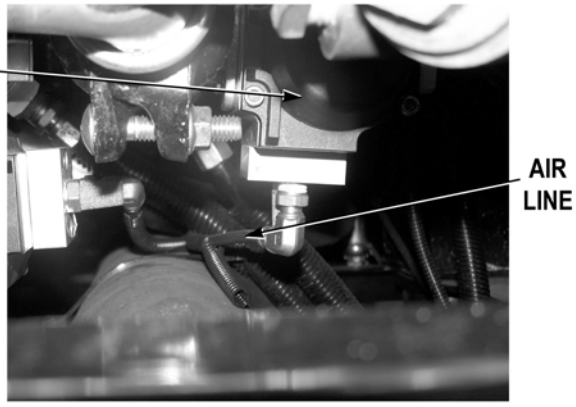
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





Step 4. Put cab UNDER TRUCK NOZZLES switch to off position (WP 0004). Put cab FOAM SYSTEM switch to on position (WP 0004). While an assistant puts UNDER TRUCK NOZZLES switch to on position, check if under truck nozzles foam metering valve operates to open position.

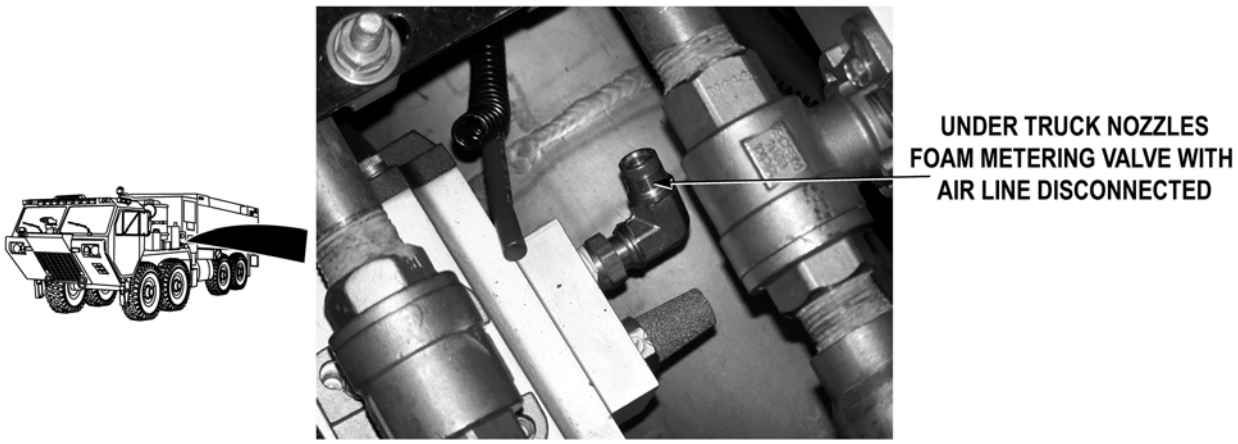
If under truck nozzles foam metering valve operates to open position, remove and clean, or replace under truck nozzles foam metering valve orifice/restrictor (WP 0172).



Step 5. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). Check air line from air control valve manifold to under truck nozzles foam metering valve for kinks and damage.

If air line is kinked or damaged, replace damaged air line (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

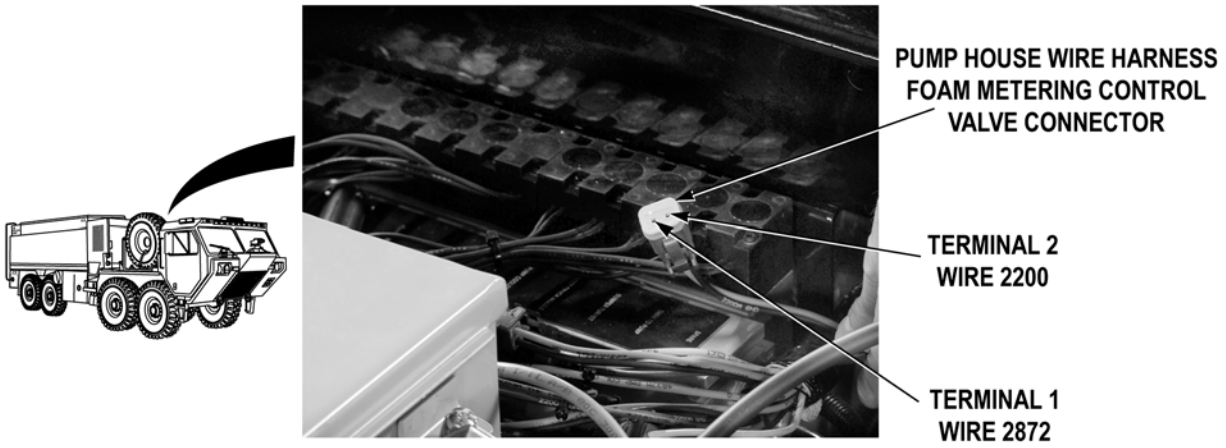
NOTE

Air pressure is checked by disconnecting air line at under truck nozzles foam metering valve and observing air pressure escaping from air line. When under truck nozzles foam metering control valve is activated, air will escape from air line. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 6. Remove hose reel (WP 0246). Disconnect air line at under truck nozzles foam metering valve (WP 0172). While an assistant puts UNDER TRUCK NOZZLES switch to on position (WP 0004), check if air pressure is present at under truck nozzles foam metering valve.

If there is air pressure, replace under truck nozzles foam metering valve (WP 0172).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 7. Connect air line at under truck nozzle foam metering valve (WP 0172). Disconnect pump house wire harness under truck nozzles foam metering control valve connector. Put cab UNDER TRUCK NOZZLES switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2872 (gray) at under truck nozzles foam metering control valve connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, repair wire 2872 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 8. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness under truck nozzles foam metering control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace under truck nozzles foam metering control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM NOT DELIVERED WHEN MANUAL METERING CONTROL IS OPERATED

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

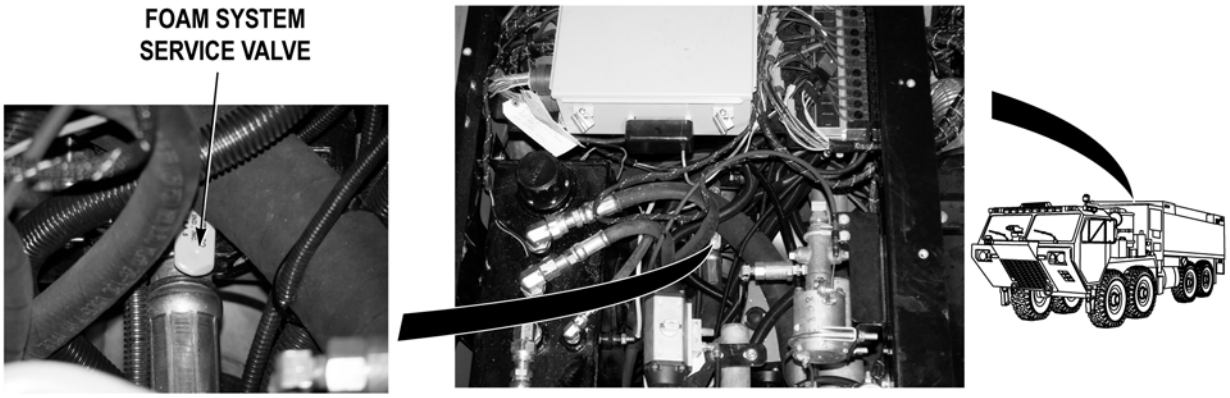
References
WP 0004
WP 0007
WP 0008
WP 0018
WP 0020

References (continued)
WP 0021
WP 0023
WP 0056
WP 0179
WP 0322
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

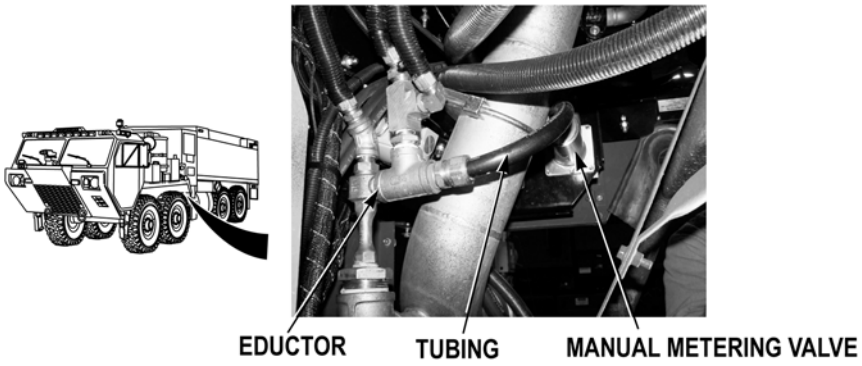
FOAM NOT DELIVERED WHEN MANUAL METERING CONTROL IS OPERATED



Step 1. Remove pump house panel K (WP 0341). Check if foam system service valve is in open position.

If foam system service valve is not in open position, put valve to open position (WP 0004).

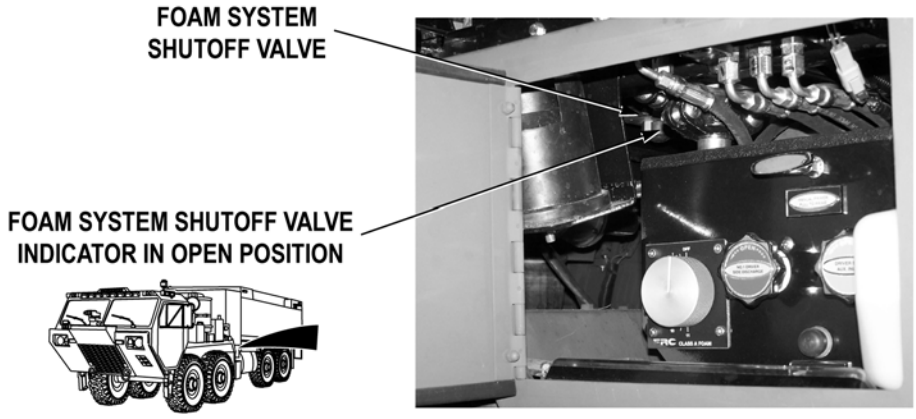
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Inspect tubing between manual metering control valve and eductor for kinks and damage.

If tubing is kinked or damaged, replace damaged tubing (WP 0322).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



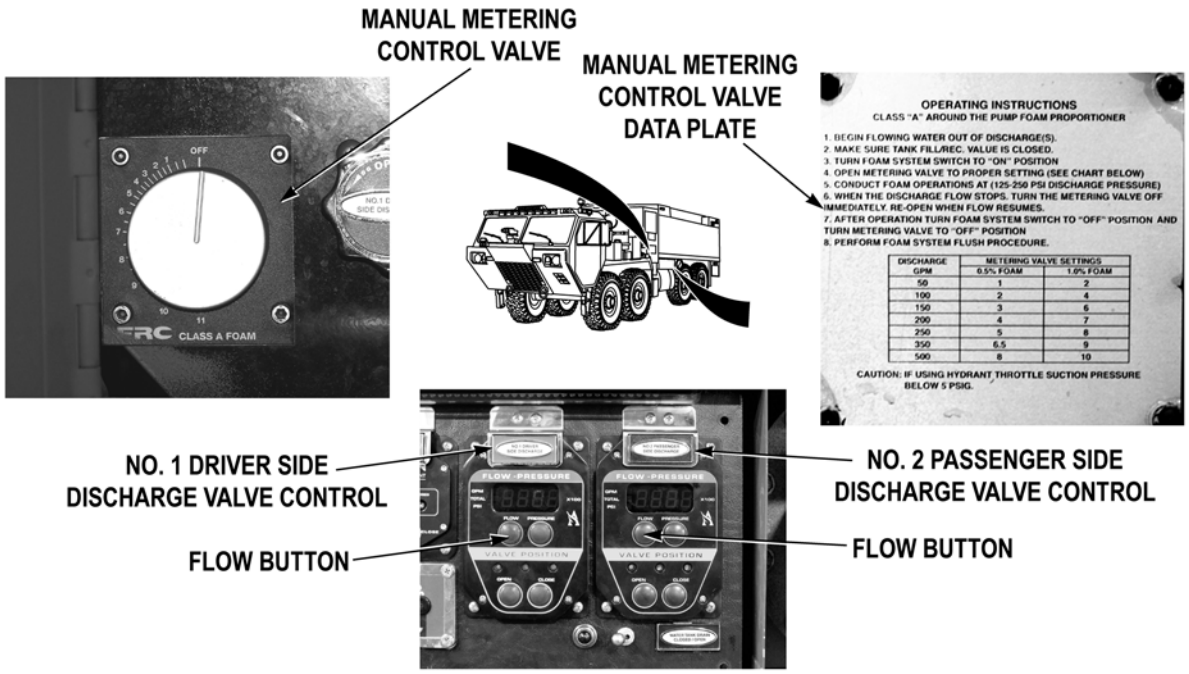
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 3. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Open pump house control access panel (WP 0008). While an assistant puts cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004), check if foam system shutoff valve operates to open position.

If foam system shutoff valve does not operate to open position, troubleshoot Foam Not Delivered From All Systems (Bumper Turret, Under Truck Nozzles, and Manual Metering Controls) or System Does Not Shut Off (WP 0056).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push NO. 1 DRIVER SIDE DISCHARGE valve control FLOW button (WP 0004). Check position of manual metering control valve. Ensure that manual metering valve is set to match output of NO. 1 DRIVER SIDE DISCHARGE valve control (WP 0020). Set manual metering control valve to proper adjustment using manual metering control valve data plate valve settings. Start engine (TM 9-2320-279-10). Set up system to pump from tank (WP 0018). Turn on foam system (WP 0023). Check if foam is delivered when system is operated. Turn off foam system (WP 0023). Flush foam system (WP 0021).

a. If foam is delivered, problem has been corrected. Notify Supervisor.

b. If foam is not delivered, replace manual metering valve (WP 0179).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM SYSTEM CANNOT BE FLUSHED

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

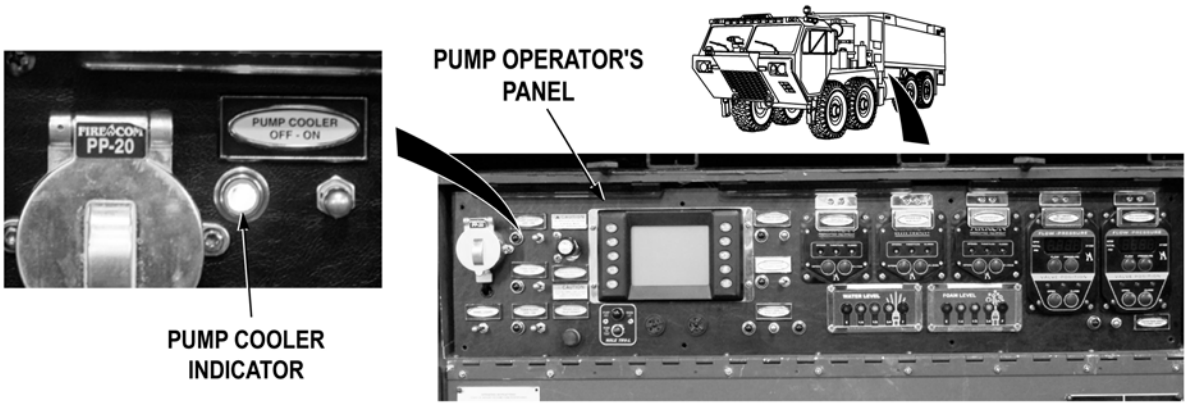
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0176
WP 0177
WP 0181
WP 0203
WP 0205

References (continued)
WP 0218
WP 0240
WP 0268
WP 0270
WP 0280
WP 0293
WP 0303
WP 0304
WP 0322
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

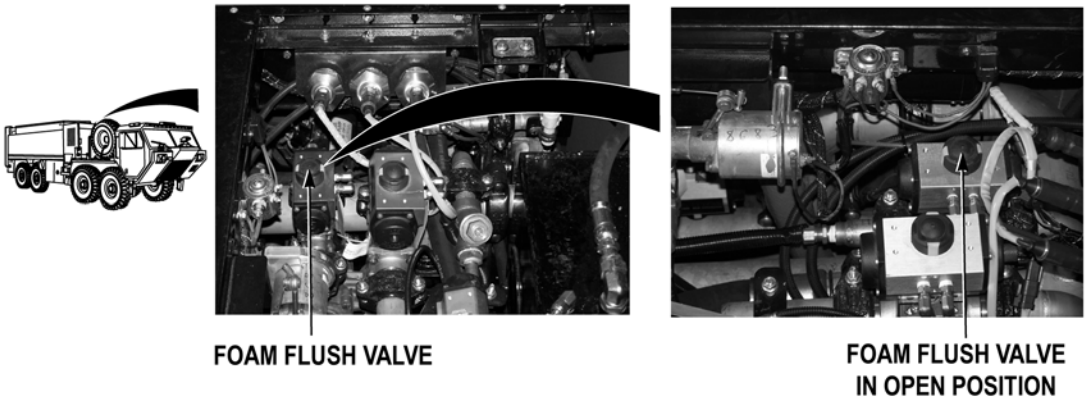
FOAM SYSTEM CANNOT BE FLUSHED



Step 1. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel PUMP COOLER switch to ON position (WP 0004). Check if PUMP COOLER indicator illuminates.

If PUMP COOLER indicator does not illuminate, go to Step 21.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



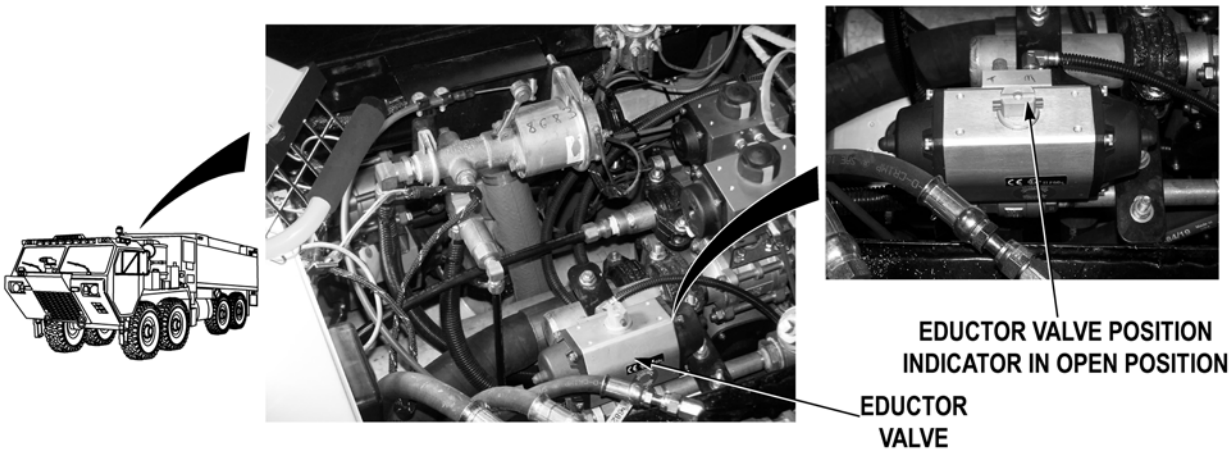
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 2. Put PUMP COOLER switch to OFF position (WP 0004). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Remove pump house panel K (WP 0341). While an assistant puts pump operator's panel FOAM FLUSH switch to ON position (WP 0004), check if foam flush valve operates to open position.

If foam flush valve does not operate to open position, go to Step 12.

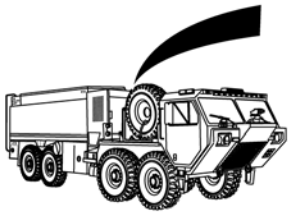
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

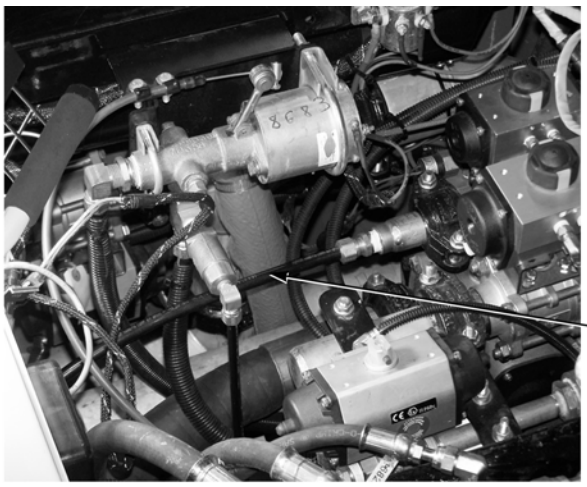


Step 3. Put FOAM FLUSH switch to OFF position (WP 0004). While an assistant puts pump operator's panel FOAM FLUSH switch to ON position (WP 0004), check if eductor valve operates to open position.

If eductor valve does not operate to open position, go to Step 5.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





Step 4. Put FOAM FLUSH switch to OFF position (WP 0004). Inspect foam flush valve tubing between foam flush valve and foam metering manifold for kinks and damage.

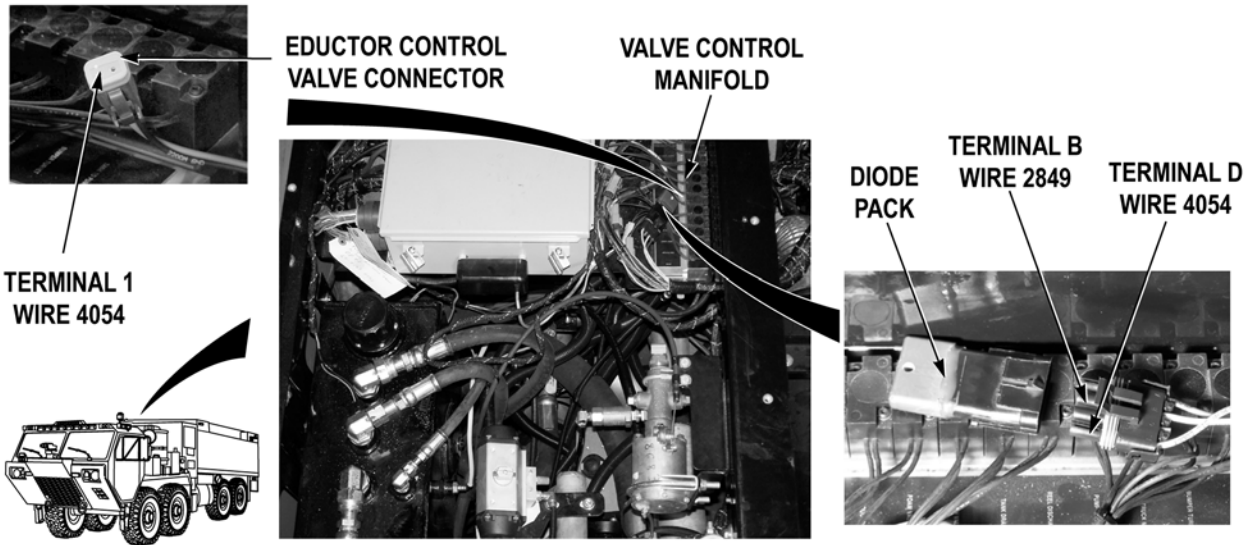
a. If foam flush valve tubing is free from kinks and/or damage, clean or replace foam flush strainer screen (WP 0181).

b. If foam flush valve tubing is kinked or damaged, replace damaged tubing (WP 0322).

Step 5. Put FOAM FLUSH switch to OFF position (WP 0004). While an assistant puts cab or pump operator's panel FOAM SYSTEM switch to ON position (WP 0004), check if eductor valve operates to open position.

If eductor valve does not operate to open position, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 6. Put FOAM SYSTEM switch to OFF position (WP 0004). Disconnect diode pack from pump house wire harness (WP 0268). Put pump operator's panel FOAM FLUSH switch to ON position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2849 (yellow) at diode pack connector, terminal B and a known good ground.

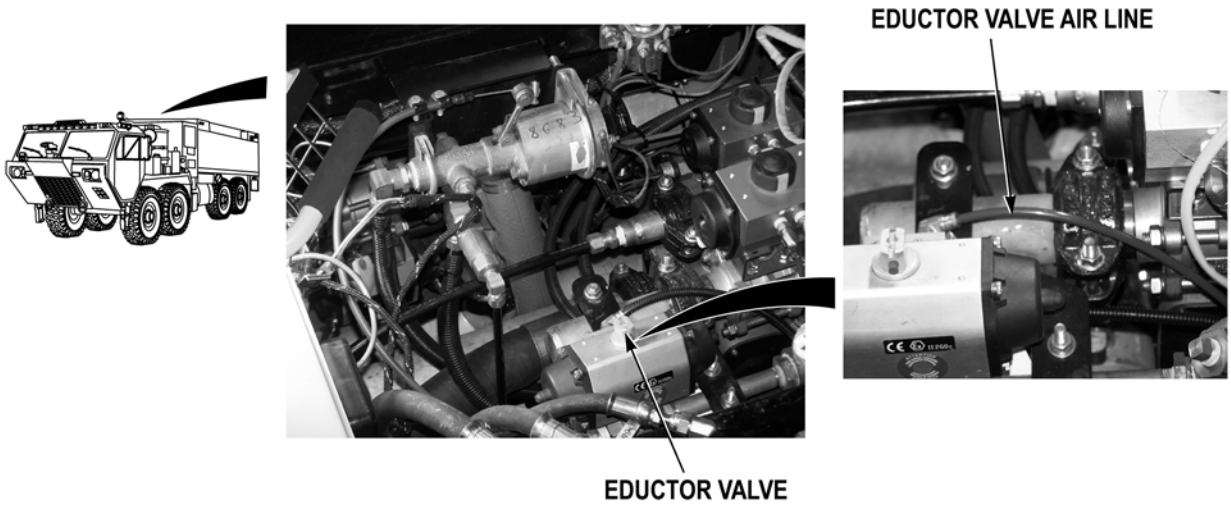
If 22 to 28 VDC are not present, repair wire 2849 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 7. Put pump operator's panel FOAM FLUSH switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness eductor control valve connector. With a test lead set, check for continuity across wire 4054 (yellow) from pump house wire harness diode pack connector, terminal D to pump house wire harness eductor control valve connector, terminal 1.

a. If there is continuity, replace diode pack (WP 0268).

b. If there is no continuity, repair wire 4054 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

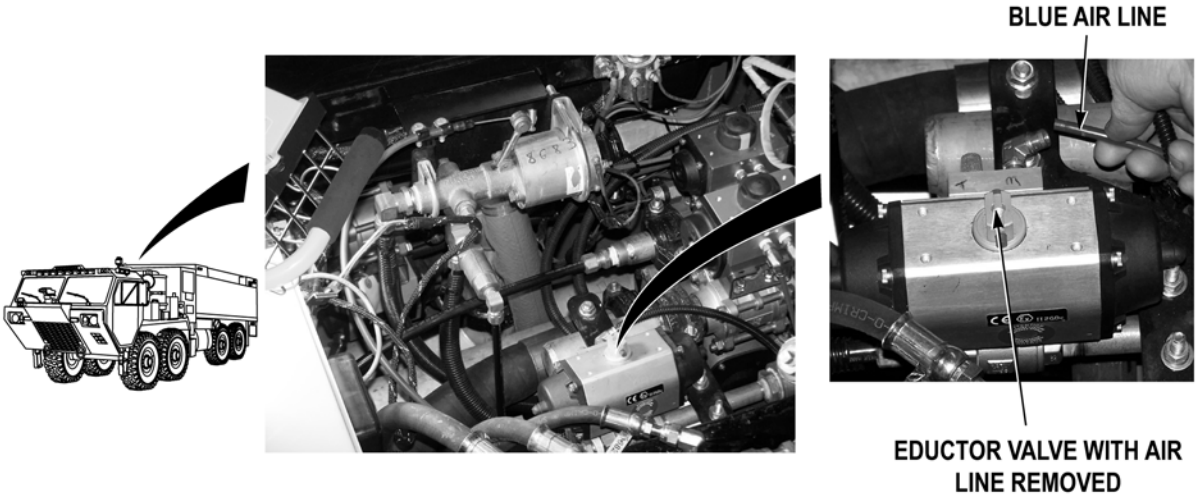
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Put FOAM SYSTEM switch to OFF position (WP 0004). Inspect air line from air control valve manifold to eductor valve for kinks and damage.

If air line is kinked or damaged, replace damaged air line (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

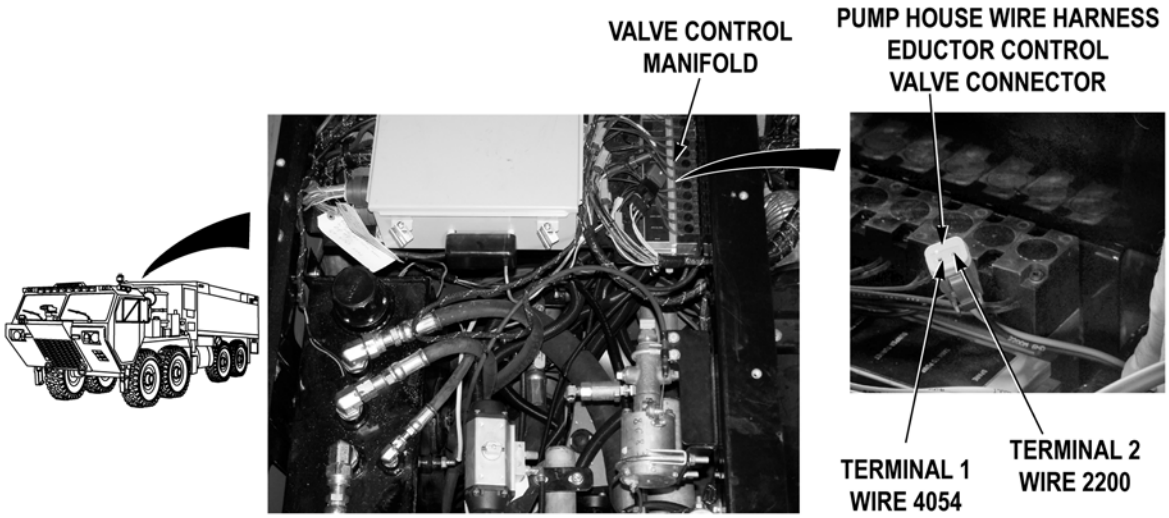
NOTE

Air pressure is checked by disconnecting air line at eductor valve and observing air pressure escaping from air line, when eductor control valve is activated. Air will escape from the blue air line when FOAM FLUSH switch is put to on position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 9. Disconnect air line at eductor valve. While an assistant puts pump operator's panel FOAM FLUSH switch to ON position (WP 0004), check if air pressure is present at eductor valve.

If there is air pressure, replace eductor valve (WP 0176).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 10. Connect air line at eductor valve. Disconnect pump house wire harness eductor control valve connector. Put pump operator's panel FOAM FLUSH switch to ON position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4054 (yellow) at pump house wire harness eductor control valve connector, terminal 1 and a known good ground.

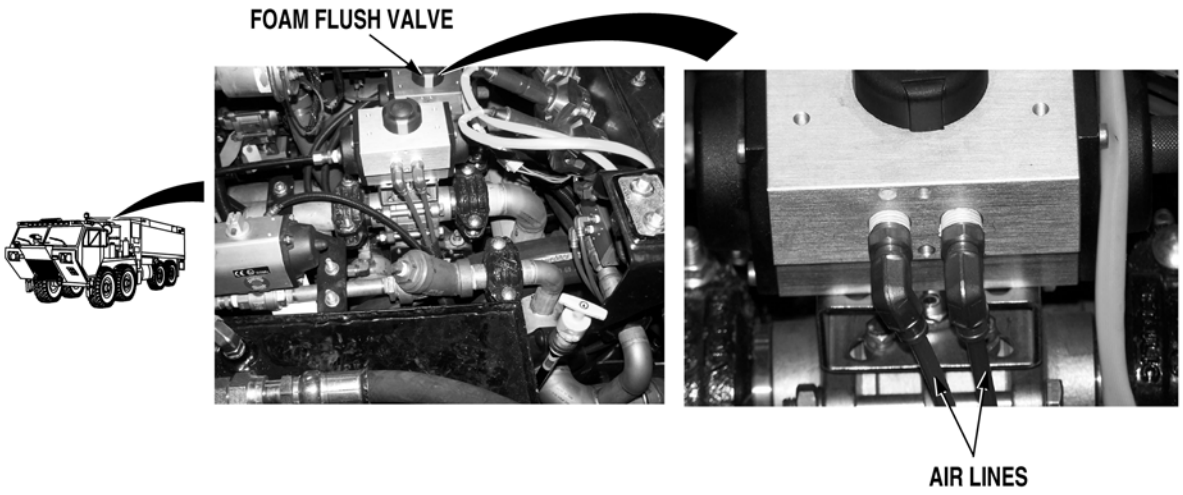
If 22 to 28 VDC are not present, repair wire 4054 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 11. Put FOAM FLUSH switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness eductor control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace eductor shutoff control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

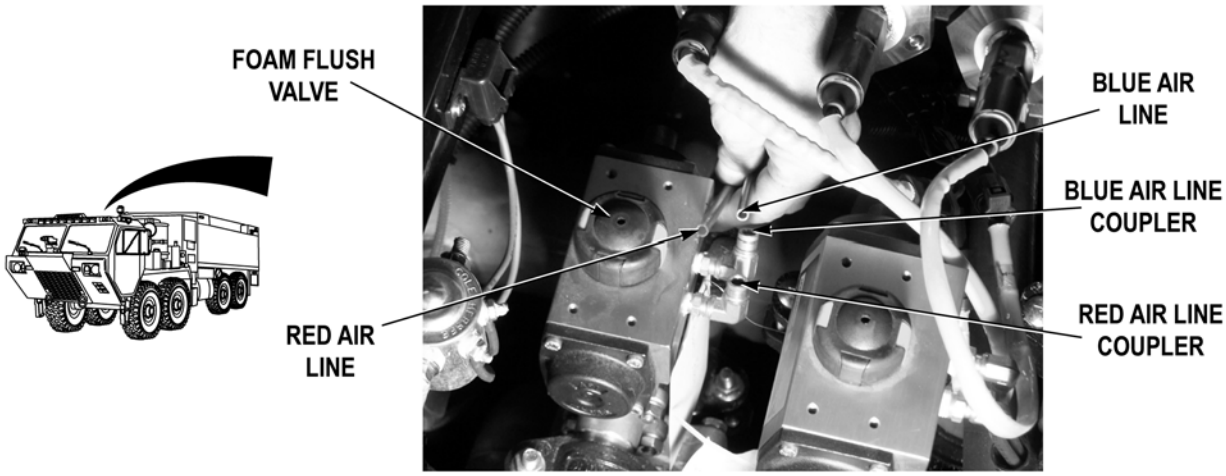
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Put FOAM FLUSH switch to OFF position (WP 0004). Inspect red and blue air lines from air control valve manifold to foam flush valve for kinks and damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

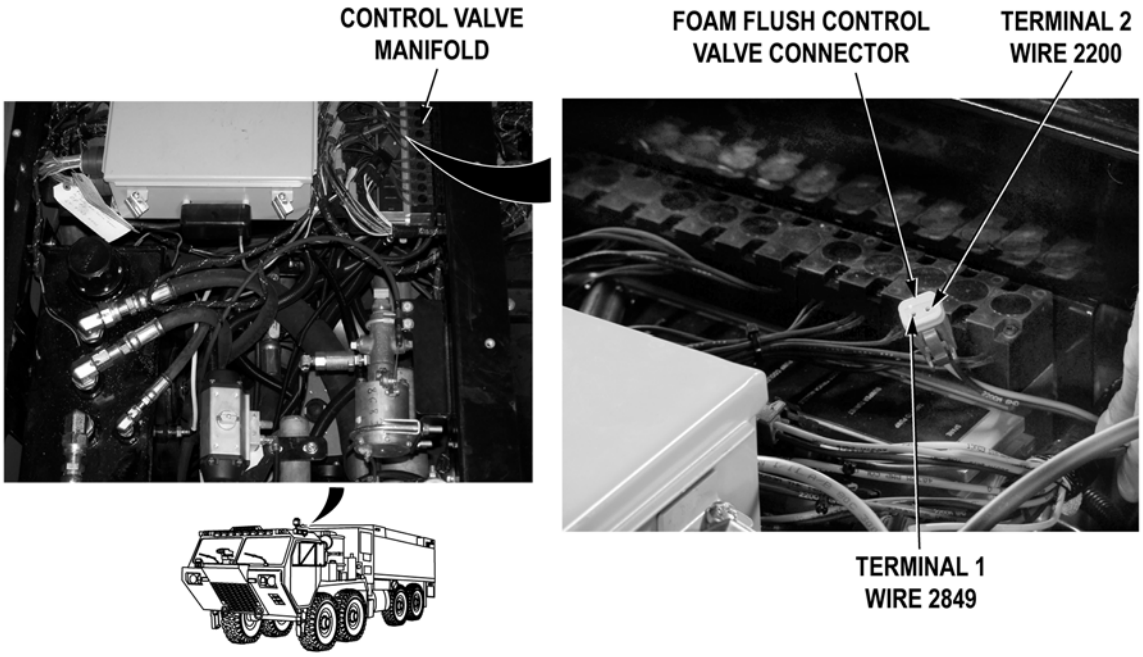
NOTE

Air pressure is checked by disconnecting air lines at foam flush valve and observing air pressure escaping from air line, when foam flush control valve is activated. Air will escape from blue air line when FOAM FLUSH switch is put to ON position, and escape from red air line when FOAM FLUSH switch is put to OFF position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 13. Disconnect air lines at foam flush valve. While an assistant puts pump operator's panel FOAM FLUSH switch to ON and OFF position (WP 0004), check if air pressure is present at foam flush valve.

If there is air pressure, replace foam flush valve (WP 0177).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Connect air lines at foam flush valve. Disconnect pump house wire harness foam flush control valve connector. Put pump operator's panel FOAM FLUSH switch to ON position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2849 (yellow) at pump house wire harness foam flush control valve connector, terminal 1 and a known good ground.

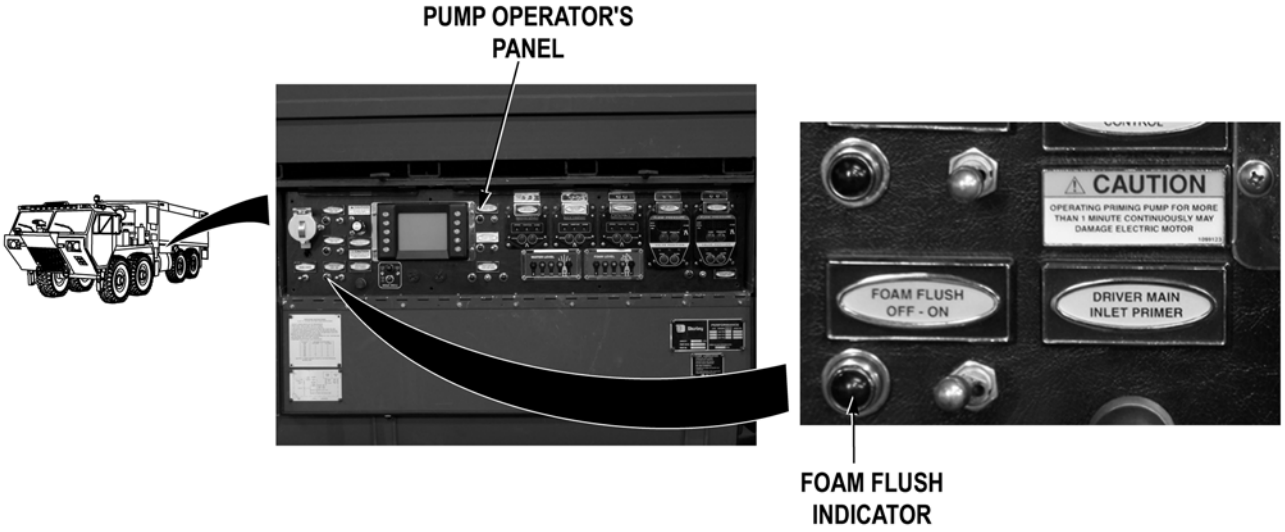
If 22 to 28 VDC are not present, go to Step 16.

Step 15. Put FOAM FLUSH switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness foam flush control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace foam flush control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Check if FOAM FLUSH indicator is illuminated (WP 0004).

If FOAM FLUSH indicator is not illuminated, go to Step 19.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

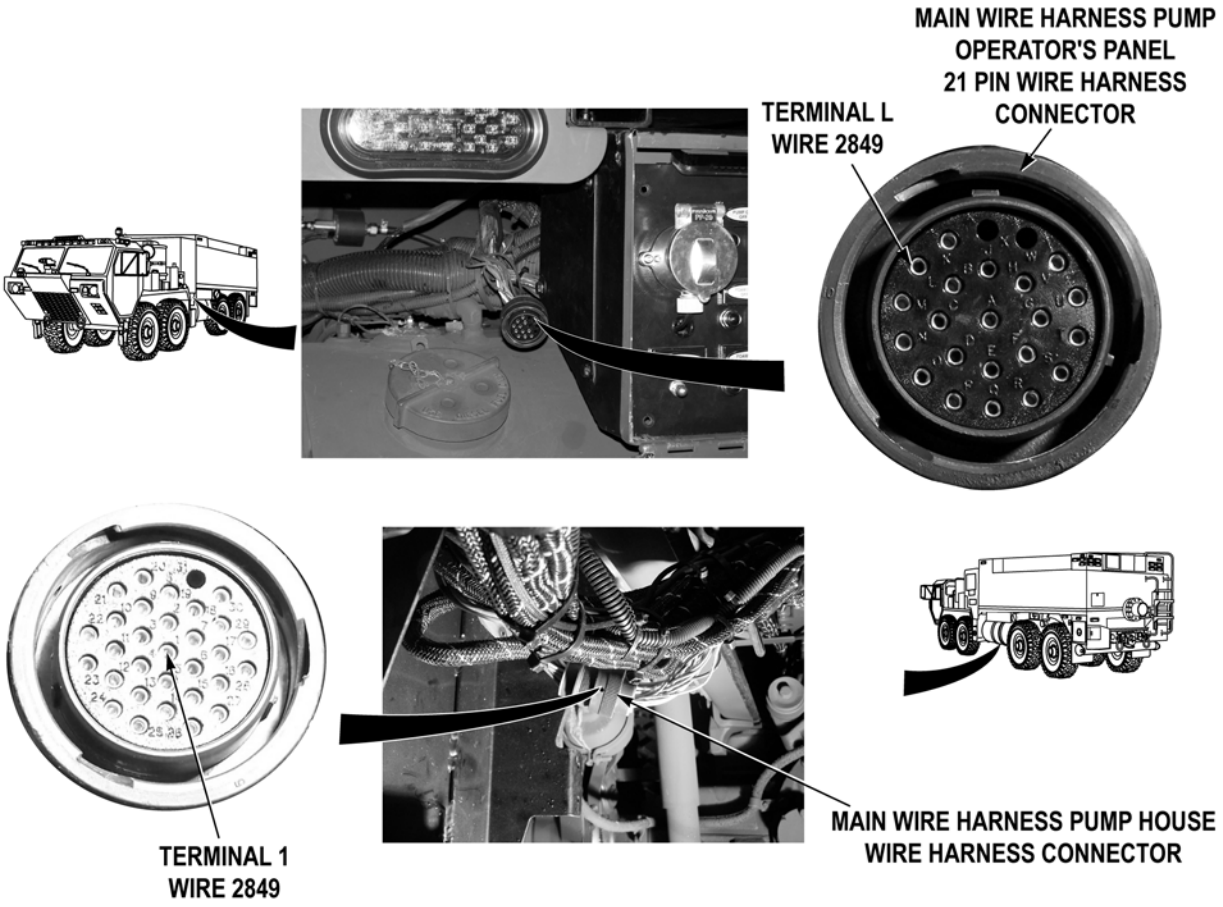
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 17. Disconnect main wire harness pump house wire harness connector. Put pump operator's panel FOAM FLUSH switch to ON position (WP 0004). With a test lead set, check for 22 to 28 VDC between main wire harness wire 2849 (yellow) at pump house wire harness connector, terminal 1, and a known good ground.

If 22 to 28 VDC are present, repair wire 2849 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

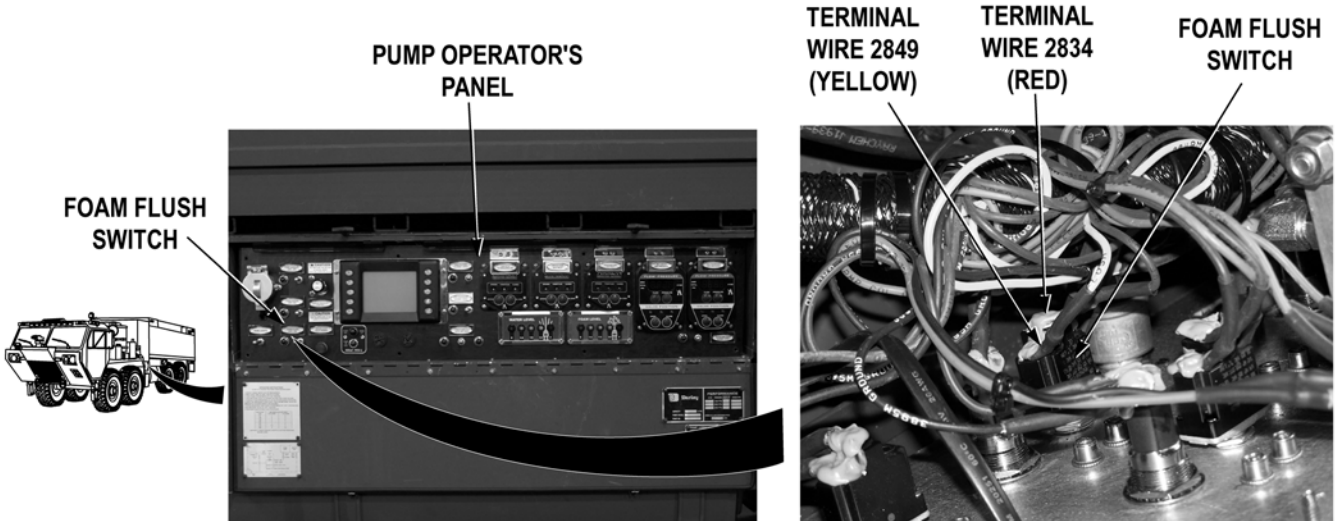


Step 18. Put FOAM FLUSH switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for continuity across main wire harness wire 2849 (yellow) from main wire harness pump operator's panel 21 pin wire harness connector, terminal L to main wire harness pump house wire harness connector, terminal 1.

a. If there is continuity, repair wire 2849 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 2849 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 19. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2834 (red) at FOAM FLUSH switch terminal and a known good ground.

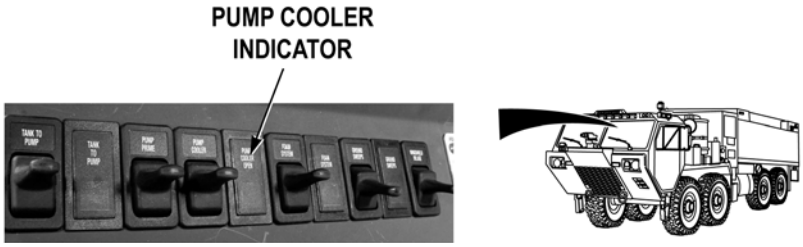
If 22 to 28 VDC are present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 20. Pull battery disconnect switch to off position (WP 0007). Put FOAM FLUSH switch to ON position (WP 0004). With a test lead set, check for continuity across pump operator's panel FOAM FLUSH switch from terminal wire 2834 (red) to terminal wire 2849 (yellow).

a. If there is continuity, repair wire 2849 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

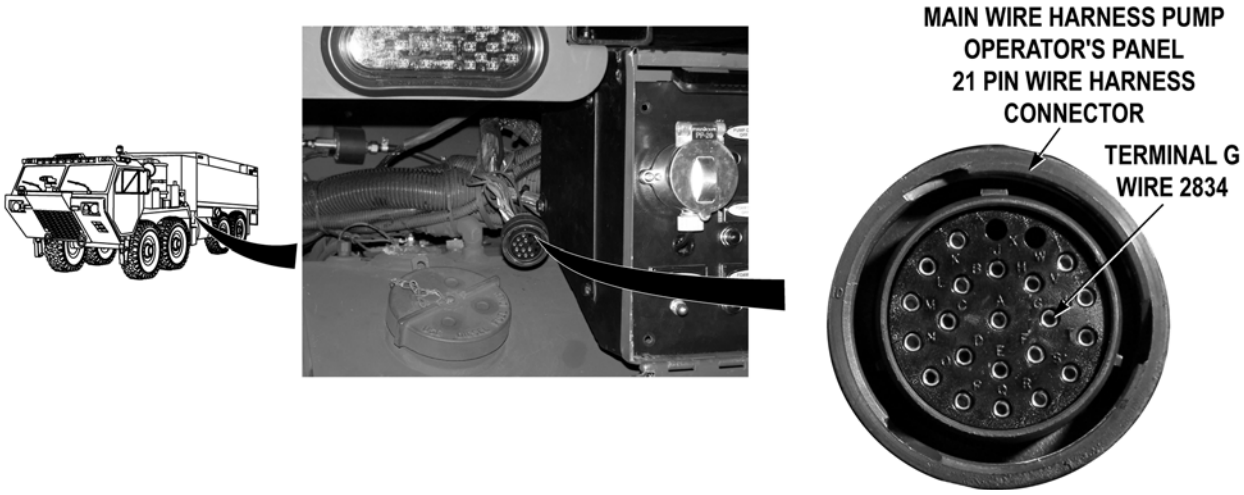
b. If there is no continuity, replace pump operator's panel FOAM FLUSH switch (WP 0218).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 21. Put pump operator's panel PUMP COOLER switch to OFF position (WP 0004). Put cab PUMP COOLER switch to ON position (WP 0004). Check if cab PUMP COOLER indicator illuminates.

If cab PUMP COOLER indicator does not illuminate, go to Step 24.



WARNING

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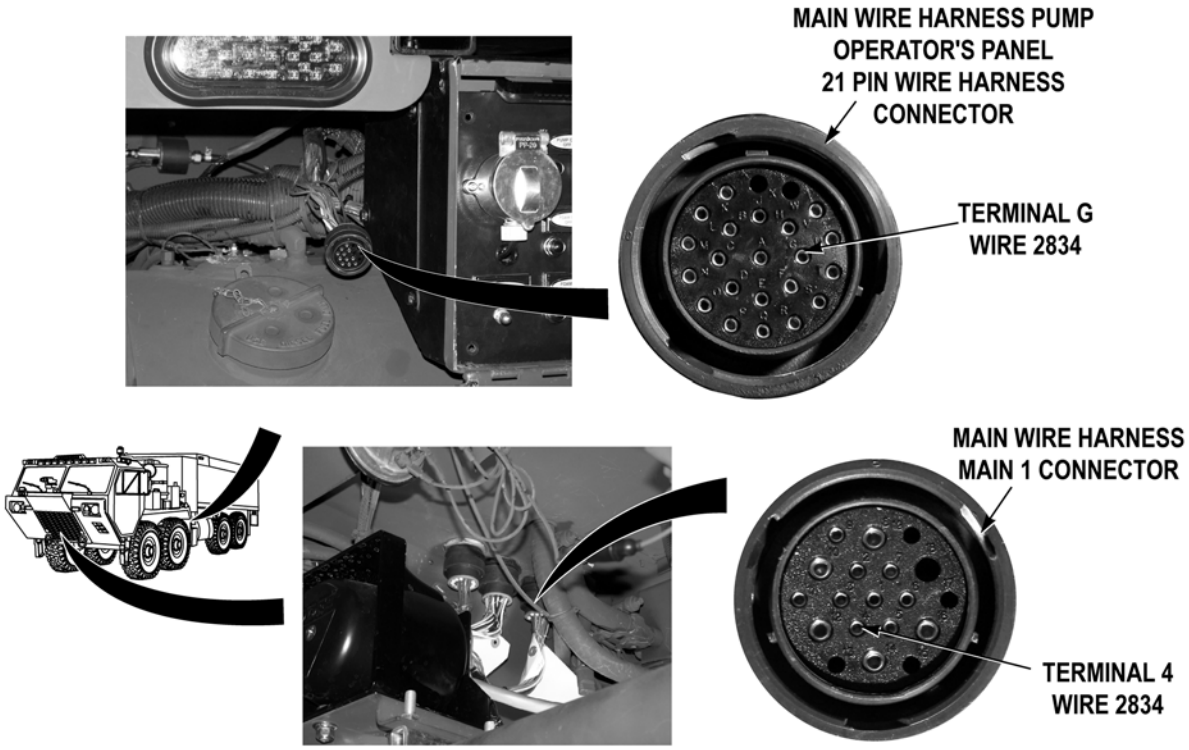
Step 22. Put cab PUMP COOLER switch to OFF position (WP 0004). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2834 (red) at pump operator's panel 21 pin wire harness connector, terminal G and a known good ground.

If 22 to 28 VDC are present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

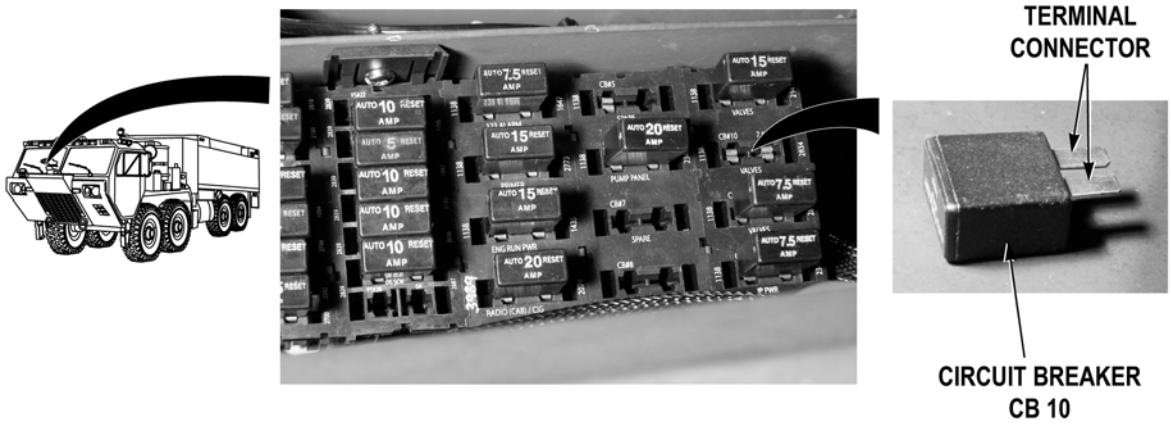


Step 23. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 2834 (red) from main 1 connector, terminal 4 to pump operator's panel 21 pin wire harness connector, terminal G.

a. If there is continuity, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2834 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 24. Remove cab instrument panel A (WP 0203). Put PUMP COOLER switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove circuit breaker 10 (WP 0240). Check for continuity across circuit breaker.

a. If there is continuity, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, replace circuit breaker 10 (WP 0240).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

'FIELD LEVEL MAINTENANCE

FOAM TANK LEVEL INDICATOR GAUGE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0010
WP 0021
WP 0128
WP 0173
WP 0187
WP 0198
WP 0203

References (continued)
WP 0205
WP 0209
WP 0210
WP 0240
WP 0278
WP 0280
WP 0281
WP 0293
WP 0304

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

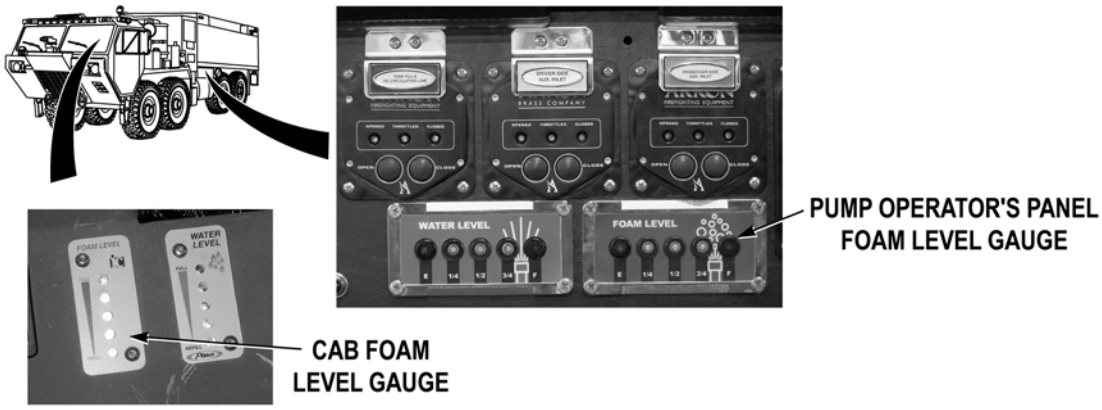
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

FOAM TANK LEVEL INDICATOR GAUGE DOES NOT OPERATE PROPERLY

NOTE

- FOAM LEVEL indicators operate as follows: "E" indicator will flash when the foam level in tank is below 1/4 full. Indicators "E" and "1/4" will illuminate when foam tank is 1/4 full. Indicators "E", "1/4", and "1/2" will illuminate when foam tank is 1/2 full. Indicators "E", "1/4", "1/2", and "3/4" will illuminate when foam tank is 3/4 full. And indicators "E", "1/4", "1/2", "3/4", and "FULL" will illuminate when foam tank is full.
- FOAM LEVEL gauge "E" indicator will illuminate or flash whenever power is applied to gauge.
- Foam level probe is designed and calibrated to detect class A foam. Substituting class A foam with other liquids will send a false signal to FOAM LEVEL gauge. If it is suspected that foam system has been contaminated or compromised with different brands and/or types of foam, drain foam tank (WP 0021) and fill with class A foam.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). Open pump operator's panel cover (WP 0010). Check if cab and pump operator's panel FOAM LEVEL gauge indicators illuminate or flash (WP 0004).

If cab and pump operator's panel FOAM LEVEL gauge indicators do not illuminate or flash, go to Step 9.

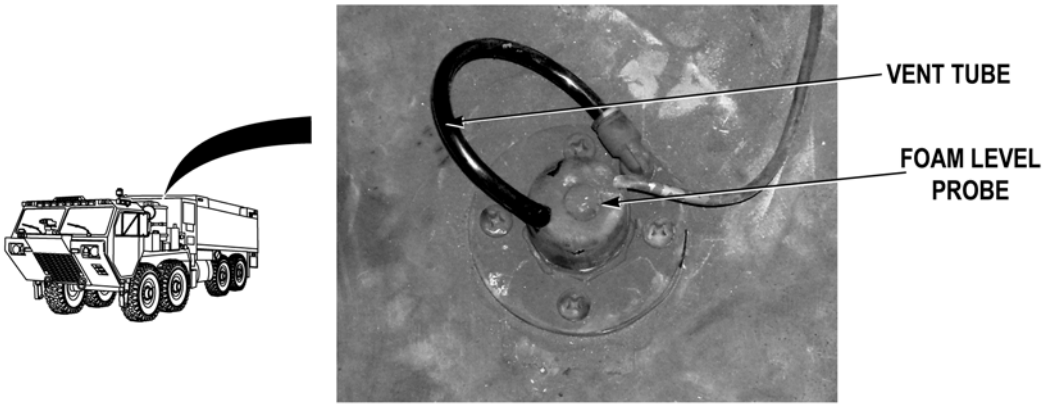
Step 2. Check if only pump operator's panel FOAM LEVEL gauge indicators illuminate or flash (WP 0004).

If cab FOAM LEVEL gauge indicators do not illuminate or flash, go to Step 6.

Step 3. With foam tank filled (WP 0021), check if cab and pump operator's panel FOAM LEVEL gauges show equal readings (WP 0004).

If cab and pump operator's panel FOAM LEVEL gauges do not show equal readings, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Pull battery disconnect switch to off position (WP 0007). Remove foam/water tank level probe cover (WP 0187). Check foam level probe vent tube for kinks, blockage, and damage.

If foam level probe vent tube is kinked, blocked, or damaged, remove blockage or replace foam level probe (WP 0173).

WARNING

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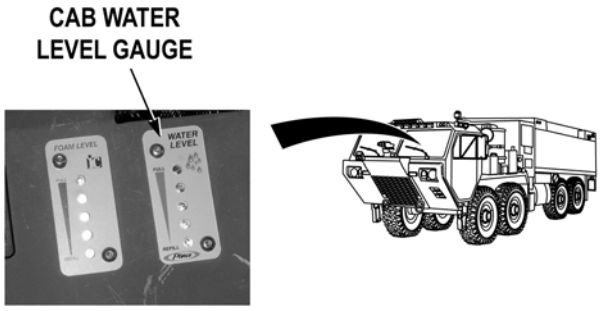
Step 5. Calibrate pump operator's panel foam level gauge (WP 0128). Push battery disconnect switch to on position (WP 0007). Check if pump operator's panel FOAM LEVEL gauge indicates correct foam level in tank after calibration of pump operator's panel foam level gauge has been performed.

a. If pump operator's panel FOAM LEVEL gauge indicates correct foam level in tank, fault corrected.

b. If pump operator's panel FOAM LEVEL gauge does not indicate correct foam level in tank, replace foam level probe (WP 0173).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



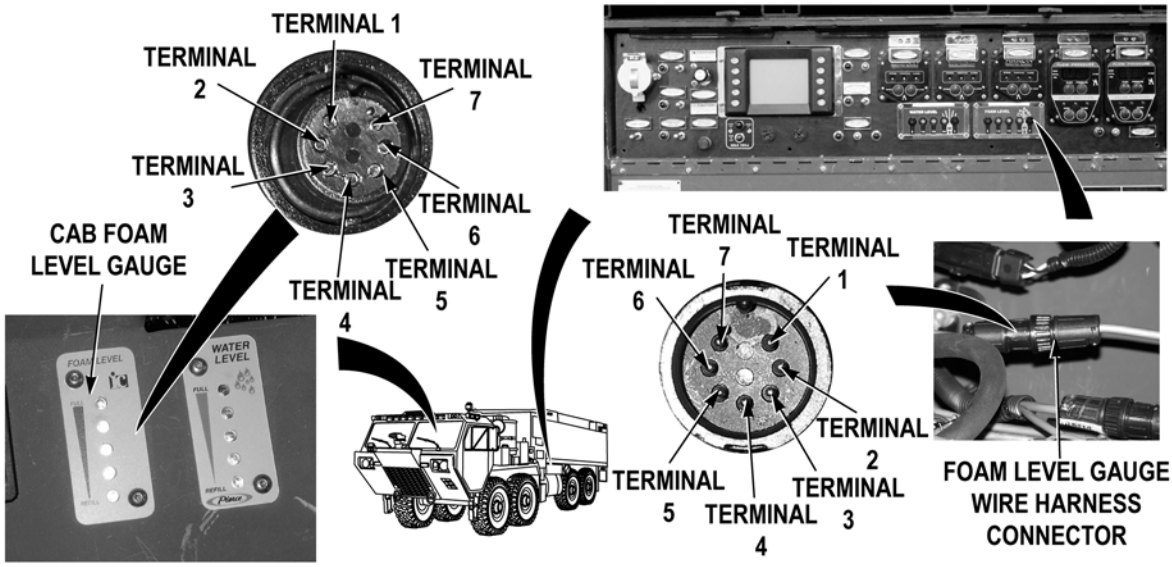
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 6. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect cab water tank level gauge wire harness connector from pump operator's panel WATER LEVEL gauge. Disconnect cab foam level gauge wire harness connector from pump operator's panel FOAM LEVEL gauge. Connect cab water level gauge wire harness connector to pump operator's panel FOAM LEVEL gauge. Push battery disconnect switch to on position (WP 0007). Check if cab WATER LEVEL gauge illuminates (WP 0004).

If cab WATER LEVEL gauge does not illuminate, replace pump operator's panel FOAM LEVEL gauge (WP 0210).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

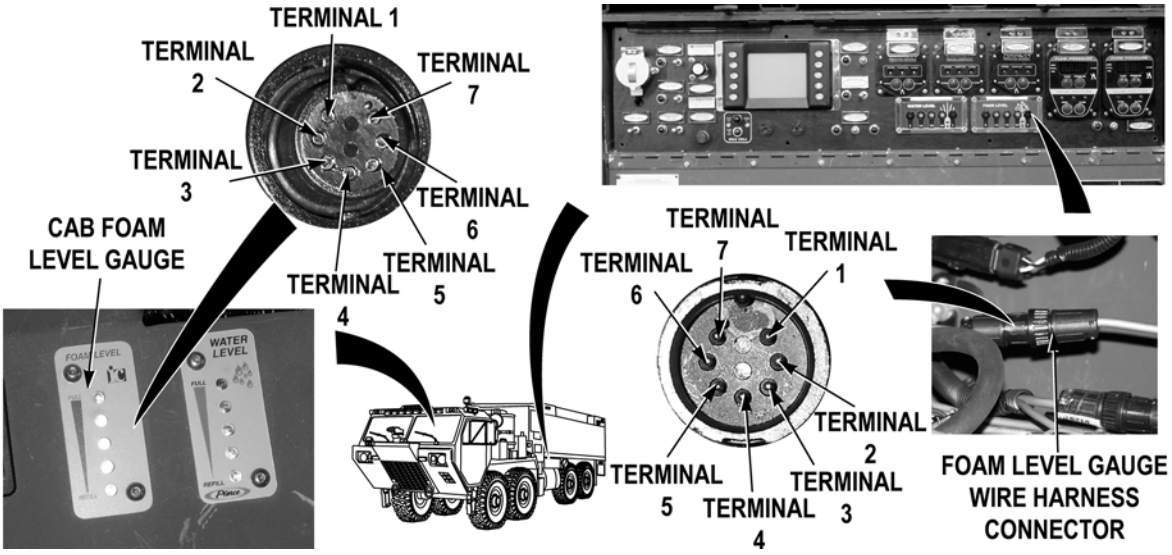


Step 7. Pull battery disconnect switch to off position (WP 0007). Disconnect cab water level gauge wire harness connector from pump operator's panel FOAM LEVEL gauge. Remove cab instrument panel A (WP 0203). Disconnect cab foam level gauge wire harness connector from cab FOAM LEVEL gauge. With a test lead set, check for continuity across cab foam level gauge harness from pump operator's panel FOAM LEVEL gauge connector, terminals 1 to cab FOAM LEVEL gauge connector, terminal 1. Note reading. Repeat continuity checks for terminals 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, and 7 to 7.

a. If there is continuity across all terminals of cab foam level gauge wire harness, replace cab FOAM LEVEL gauge (WP 0198).

b. If there is no continuity for any pair of terminals, replace cab foam level gauge harness (WP 0278).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect cab foam level gauge wire harness connector from pump operator's panel FOAM LEVEL gauge. Remove cab instrument panel A (WP 0203). Disconnect cab foam level gauge wire harness connector from cab FOAM LEVEL gauge. With a test lead set, check for continuity across cab foam level gauge wire harness from pump operator's panel FOAM LEVEL gauge connector, terminal 1 to cab FOAM LEVEL gauge connector, terminal 1. Note reading. Repeat continuity checks for terminals 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, and 7 to 7.

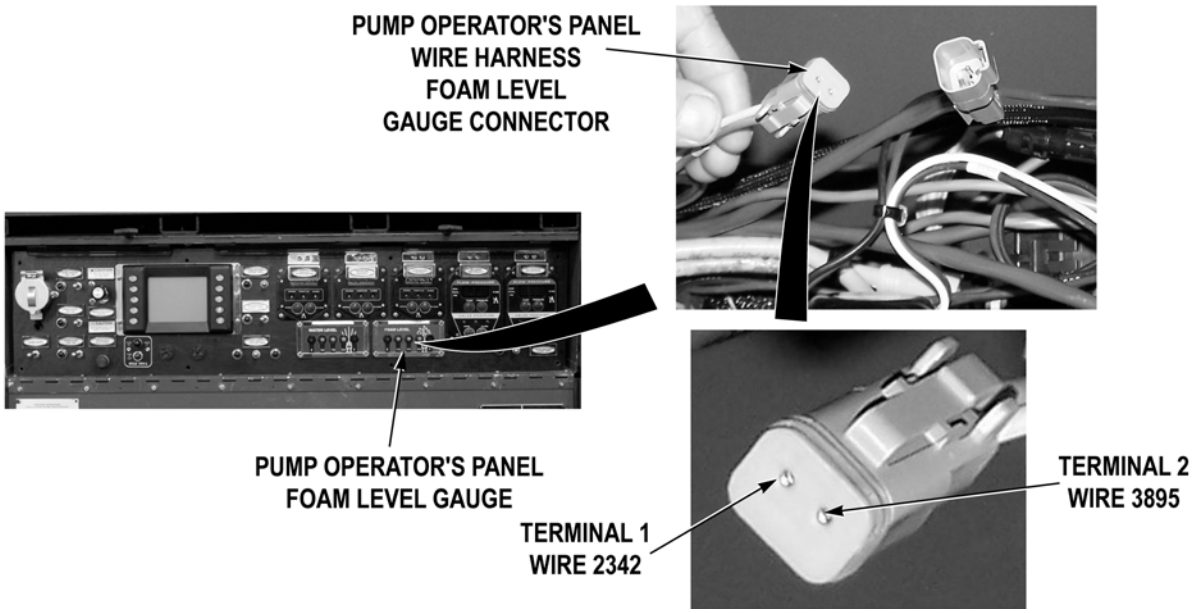
a. If there is continuity across all terminals of cab foam level gauge wire harness, replace pump operator's panel FOAM LEVEL gauge (WP 0210).

b. If there is no continuity for any pair of terminals, replace cab foam level gauge harness (WP 0278).

Step 9. Check if pump operator's panel WATER LEVEL gauge indicators illuminate or flash (WP 0004).

If pump operator's panel WATER LEVEL gauge indicators do not illuminate or flash, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 10. Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness FOAM LEVEL gauge connector. With a test lead set, check for 22 to 28 VDC between wire 2342 (red) at pump operator's panel wire harness FOAM LEVEL gauge connector, terminal 1 and a known good ground.

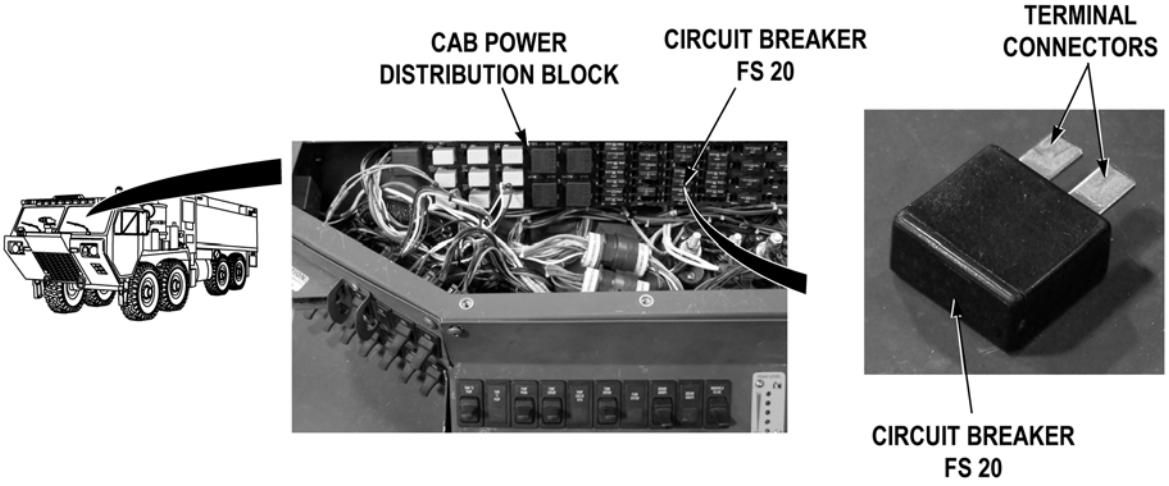
If 22 to 28 VDC are not present, repair wire 2342 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 11. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel FOAM LEVEL gauge connector, terminal 2 to a known good ground.

a. If there is continuity, replace pump operator's panel FOAM LEVEL gauge (WP 0209).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



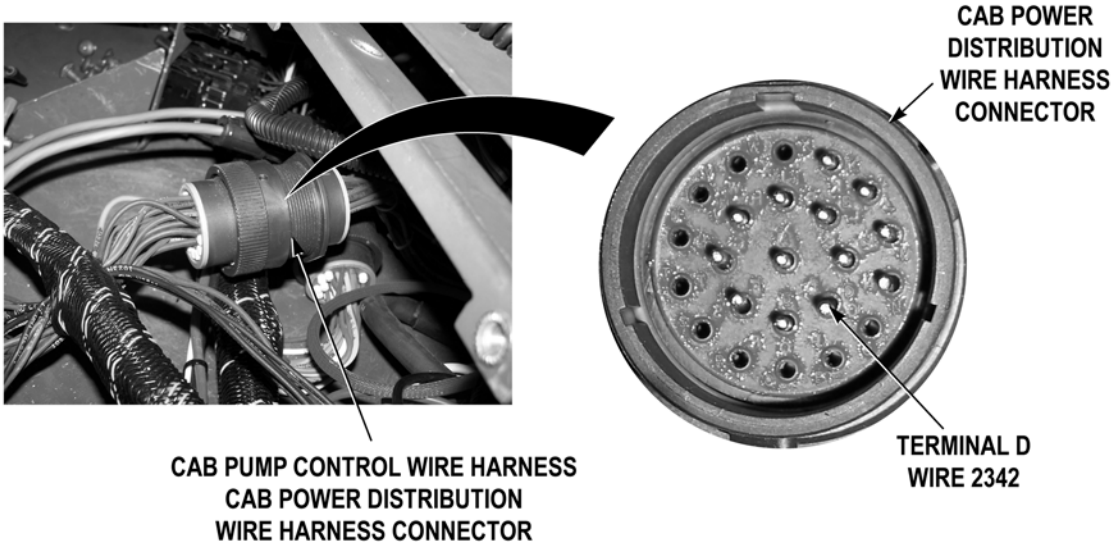
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 12. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 20 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 20 (WP 0240).

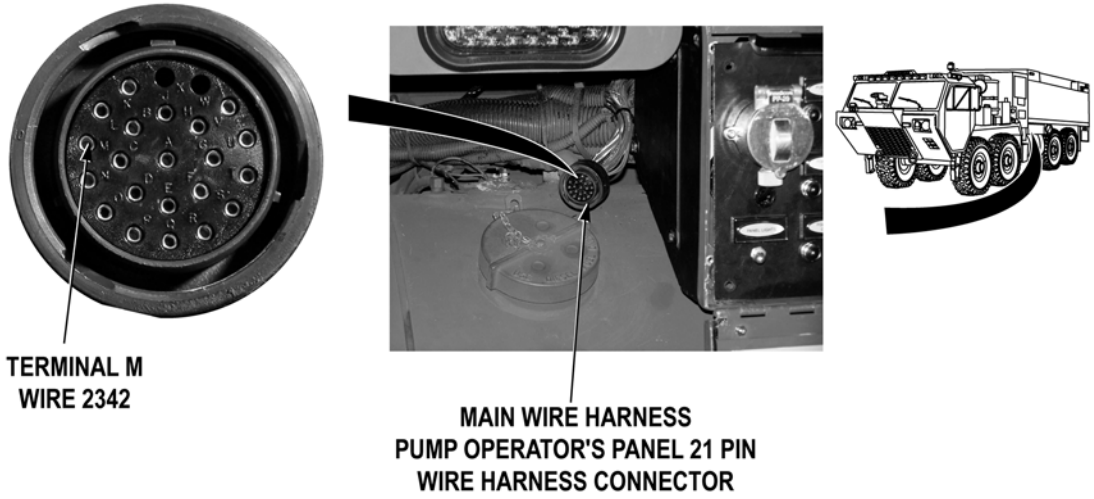
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Install circuit breaker FS 20 (WP 0240). Disconnect cab pump control wire harness cab power distribution wire harness connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 2342 (red) at cab pump control wire harness cab power distribution wire harness connector, terminal D and a known good ground.

If 22 to 28 VDC are not present, repair wire 2342 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

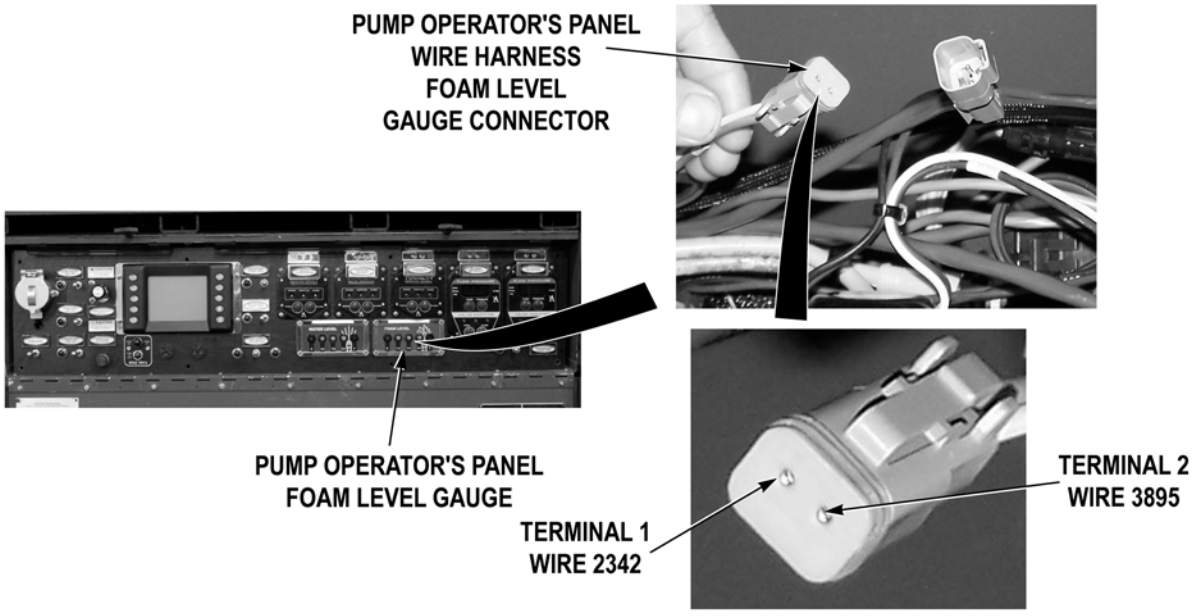
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Connect cab pump control wire harness cab power distribution wire harness connector. Disconnect main wire harness pump operator’s panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2342 (red) at main wire harness pump operator’s panel 21 pin wire harness connector, terminal M and a known good ground.

If 22 to 28 VDC are not present, go to Step 16.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

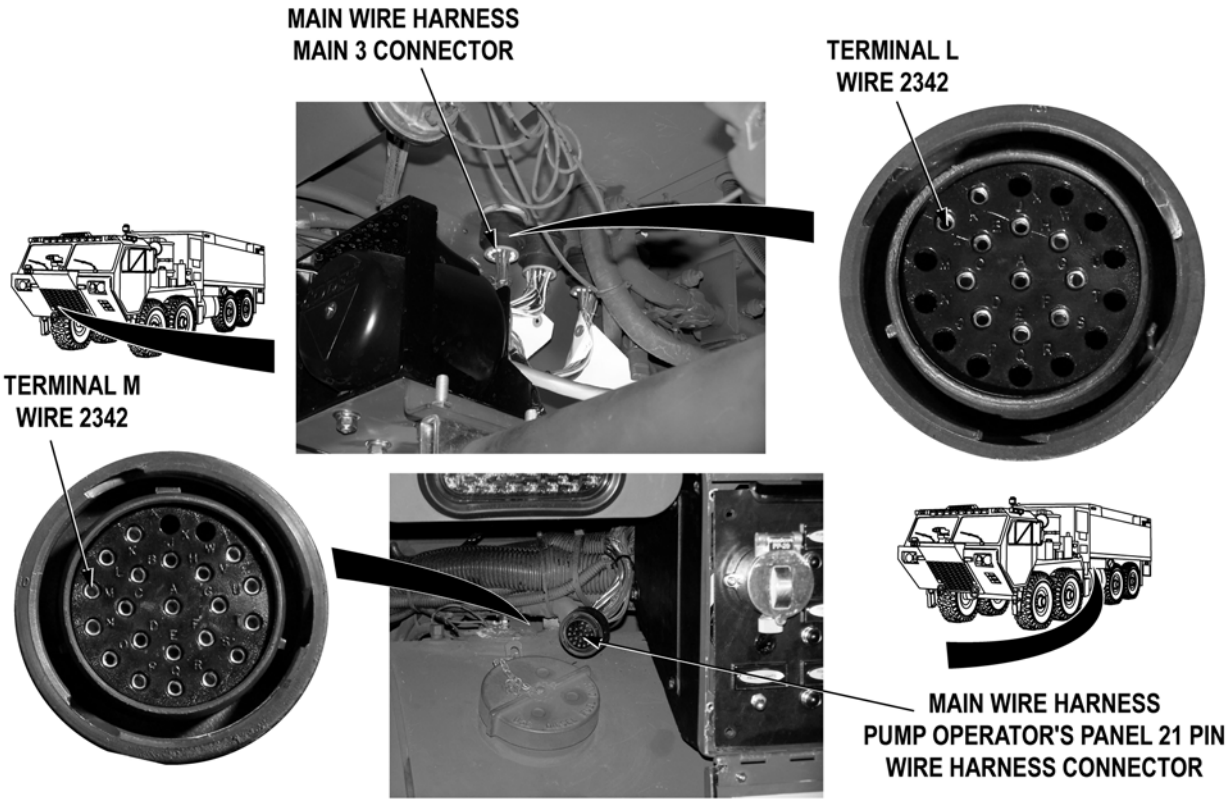


Step 15. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness FOAM LEVEL gauge connector. With a test lead set, check for continuity across pump operator's panel wire harness wire 3895 (black) from FOAM LEVEL gauge connector, terminal 2 to a known good ground.

a. If there is continuity, repair wire 2342 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2342 (red) from main 3 connector, terminal L to main wire harness pump operator's panel 21 pin wire harness connector, terminal M.

a. If there is continuity, repair wire 2342 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2342 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

BUMPER TURRET DOES NOT OPERATE PROPERLY WHEN SELECTED

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0009
WP 0021
WP 0037
WP 0203
WP 0240
WP 0270

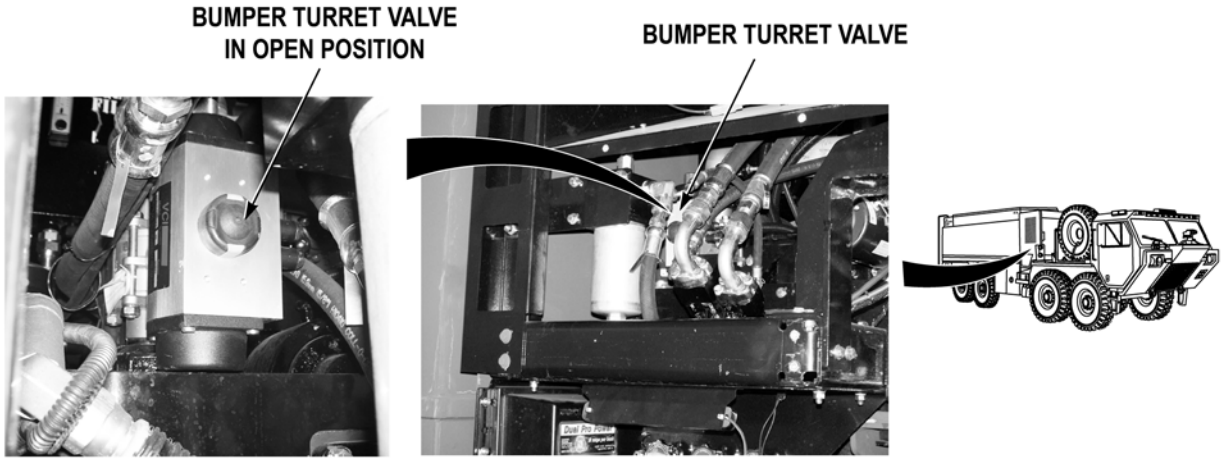
References (continued)
WP 0277
WP 0279
WP 0280
WP 0293
WP 0303
WP 0314
WP 0341
WP 0375
WP 0376
WP 0378
WP 0380

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

BUMPER TURRET DOES NOT OPERATE PROPERLY WHEN SELECTED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



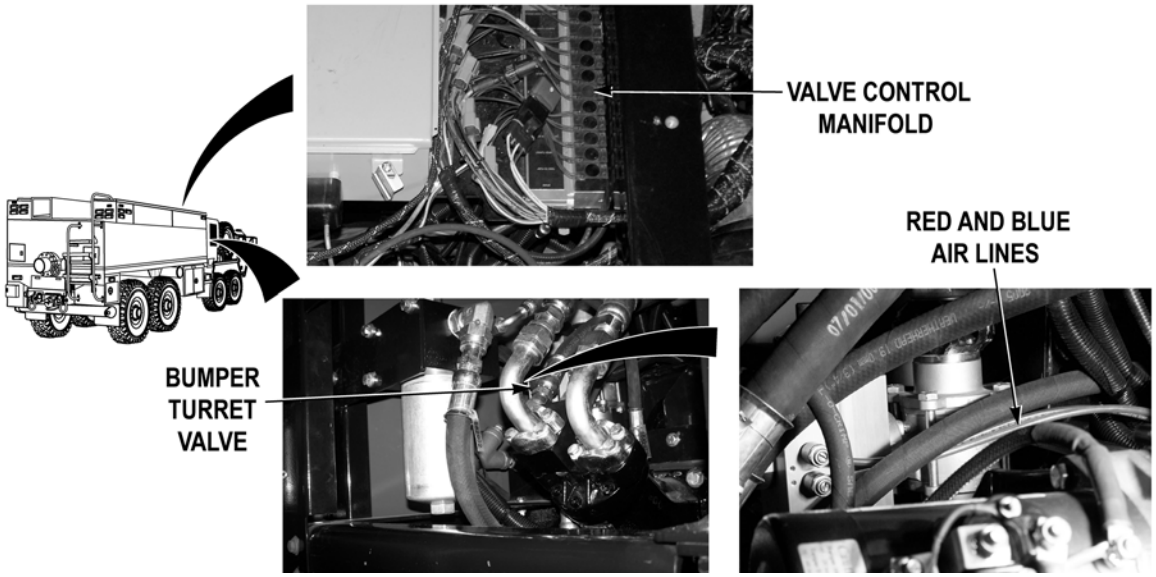
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves and operate bumper turret.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with fluid flow.

Step 1. If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Remove pump house panel H (WP 0341). Push battery disconnect switch to on position (WP 0007). Put bumper turret control POWER switch to **|** (on) position (WP 0004). While an assistant pushes and holds bumper turret control discharge switch (WP 0004), check if bumper turret valve operates to open position.

If bumper turret valve operates to open position, go to Step 15.

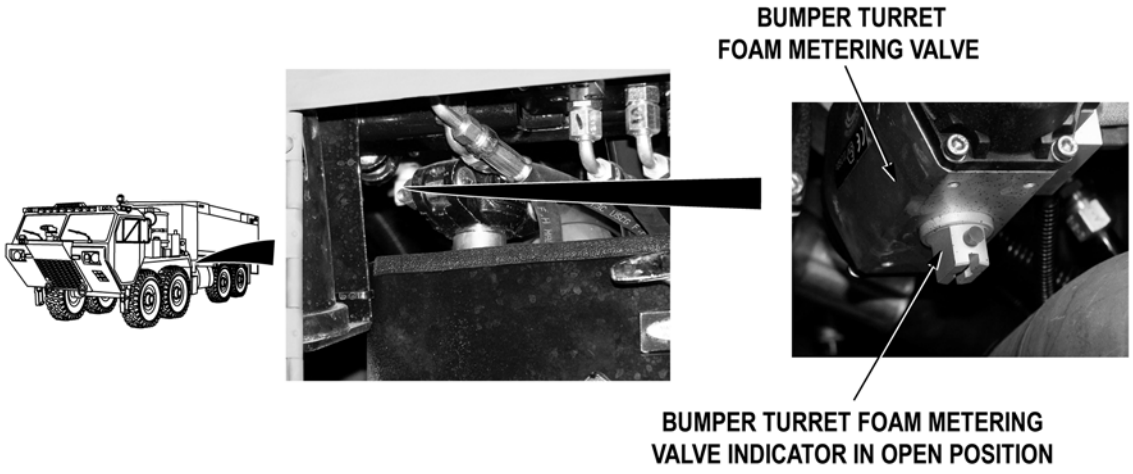
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Remove pump house panel K (WP 0341). Inspect red and blue air lines from valve control manifold to bumper turret valve for kinks and damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

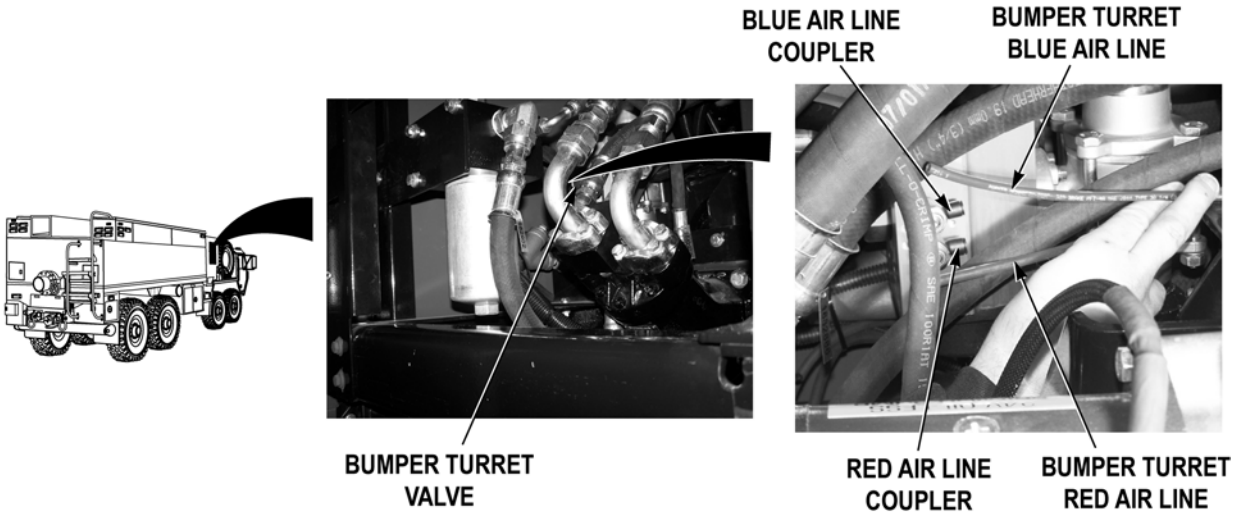
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Release bumper turret control discharge switch (WP 0004). Open pump house access door assembly (WP 0009). Put FOAM SYSTEM switch to ON position. While an assistant pushes and holds bumper turret control discharge switch, check if bumper turret foam metering valve operates to open position. Flush foam system (WP 0021).

If bumper turret foam metering valve does not operate to open position, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

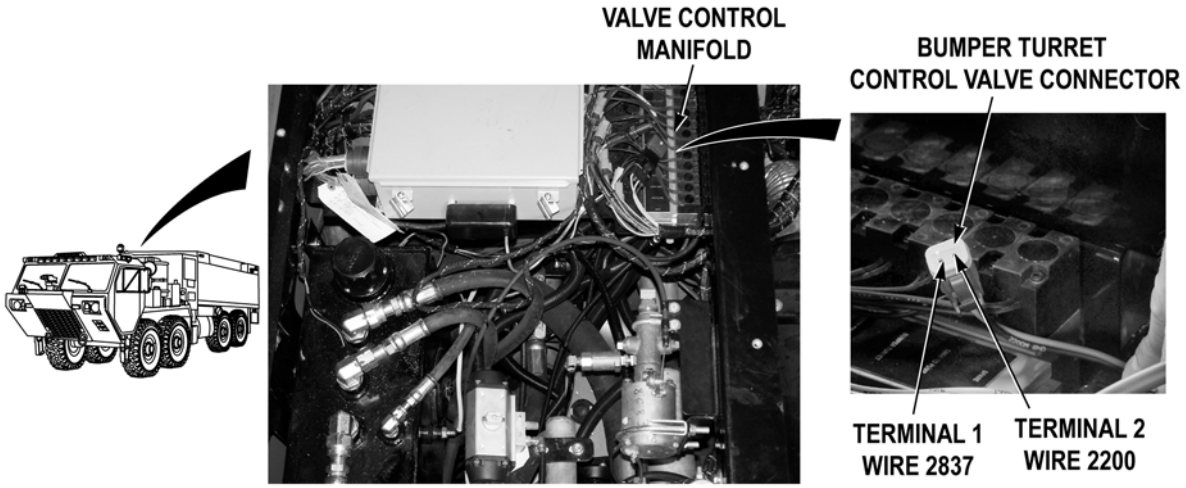
NOTE

Air pressure is checked by disconnecting air lines at bumper turret valve and observing air pressure escaping from air lines, when bumper turret valve is activated. Air will escape from blue air line when bumper turret control discharge switch is pressed, and escape from red air line when bumper turret control discharge switch is released. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 4. Release bumper turret control discharge switch (WP 0004). Disconnect air lines at bumper turret valve. While an assistant pushes and releases bumper turret control discharge switch, check if air pressure is present at bumper turret valve.

If there is air pressure, replace bumper turret valve (WP 0314).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Connect air lines at bumper turret valve. Disconnect pump house wire harness bumper turret control valve connector. While an assistant pushes and holds bumper turret control discharge switch (WP 0004), with a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2837 (gray) at bumper turret control valve connector, terminal 1 and a known good ground.

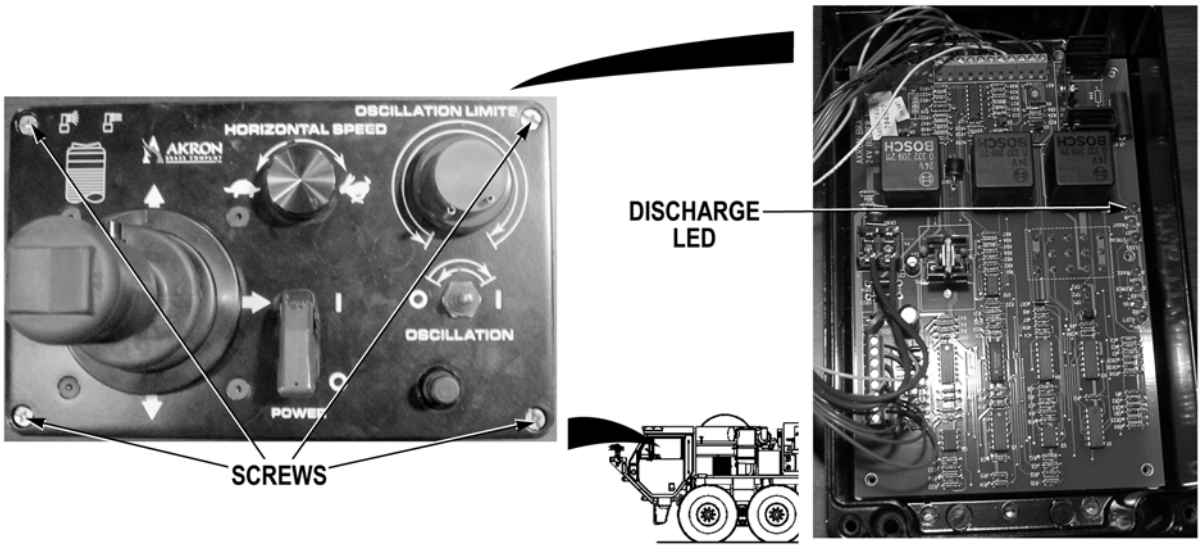
If 22 to 28 VDC are not present, repair wire 2837 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 6. Release bumper turret control discharge switch (WP 0004). Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump house wire harness wire 2200 (black) from bumper turret control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace bumper turret control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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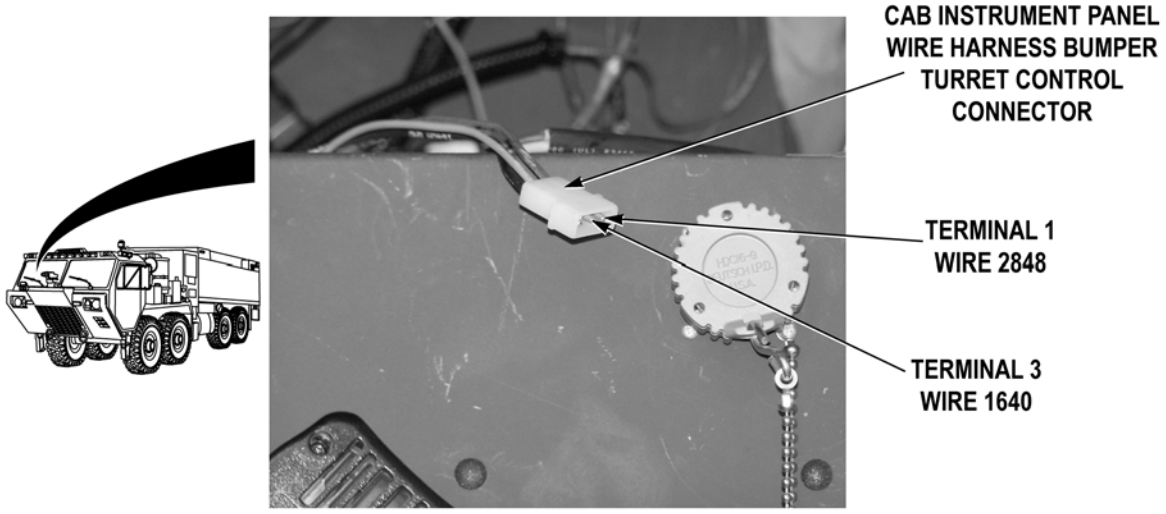
Step 7. Release bumper turret control discharge switch (WP 0004). Loosen four screws and remove bumper turret control cover. Do not disconnect wires. While pushing bumper turret control discharge switch (WP 0004), check if bumper turret control DISCHARGE LED illuminates.

If bumper turret control DISCHARGE LED illuminates, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

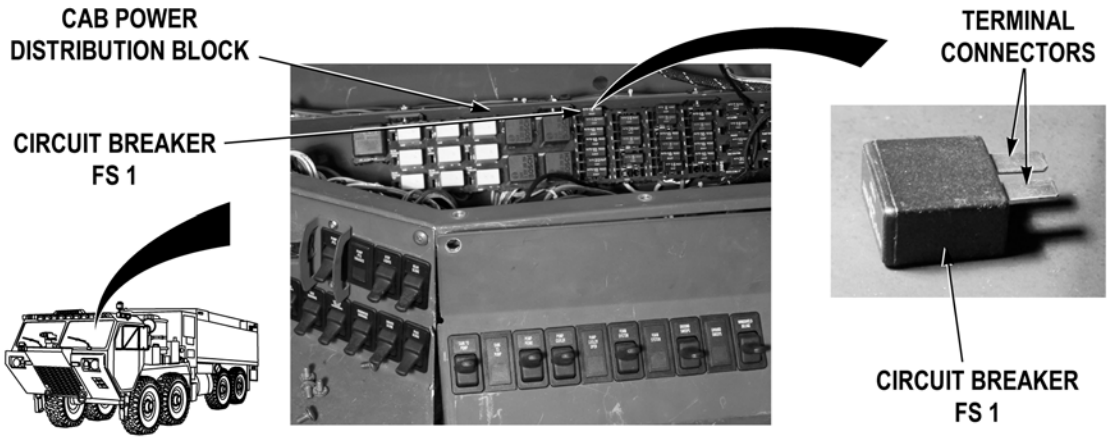
Step 8. Release bumper turret control discharge switch (WP 0004). Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Install bumper turret control cover and tighten four screws. Remove cab instrument panel E (WP 0203). Disconnect cab instrument panel wire harness bumper turret control connector. Check for continuity across cab instrument panel wire harness wire 1640 (black) from cab instrument panel wire harness bumper turret control connector, terminal 3 to a known good ground.

If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 9. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between cab instrument panel wire harness wire 2848 (red) at bumper turret control connector, terminal 1 and a known good ground.

If 22 to 28 VDC are present, replace bumper turret control (WP 0376).

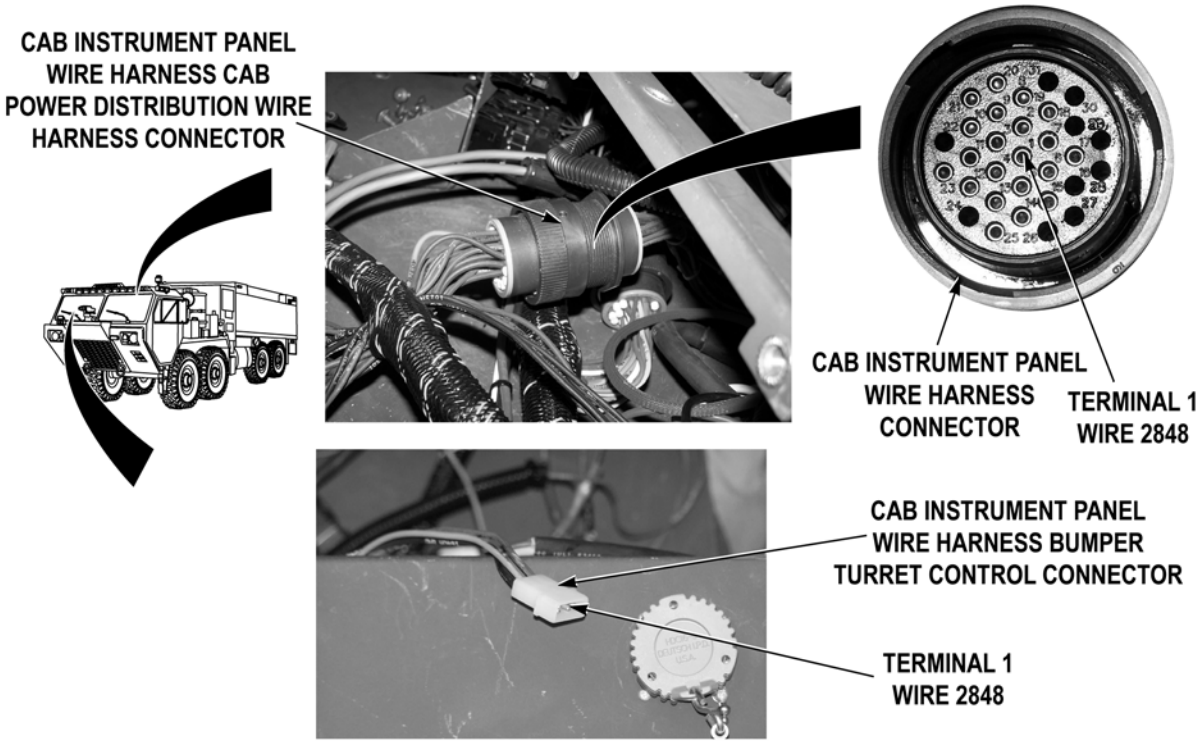
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel panel A (WP 0203). Remove circuit breaker FS 1 (WP 0240). Check for continuity across circuit breaker FS 1.

If there is no continuity, replace circuit breaker FS 1 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Install circuit breaker FS 1 (WP 0240). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 2848 (red) from cab instrument panel wire harness cab power distribution wire harness connector, terminal 1 to bumper turret control connector, terminal 1.

a. If there is continuity, repair wire 2848 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2848 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

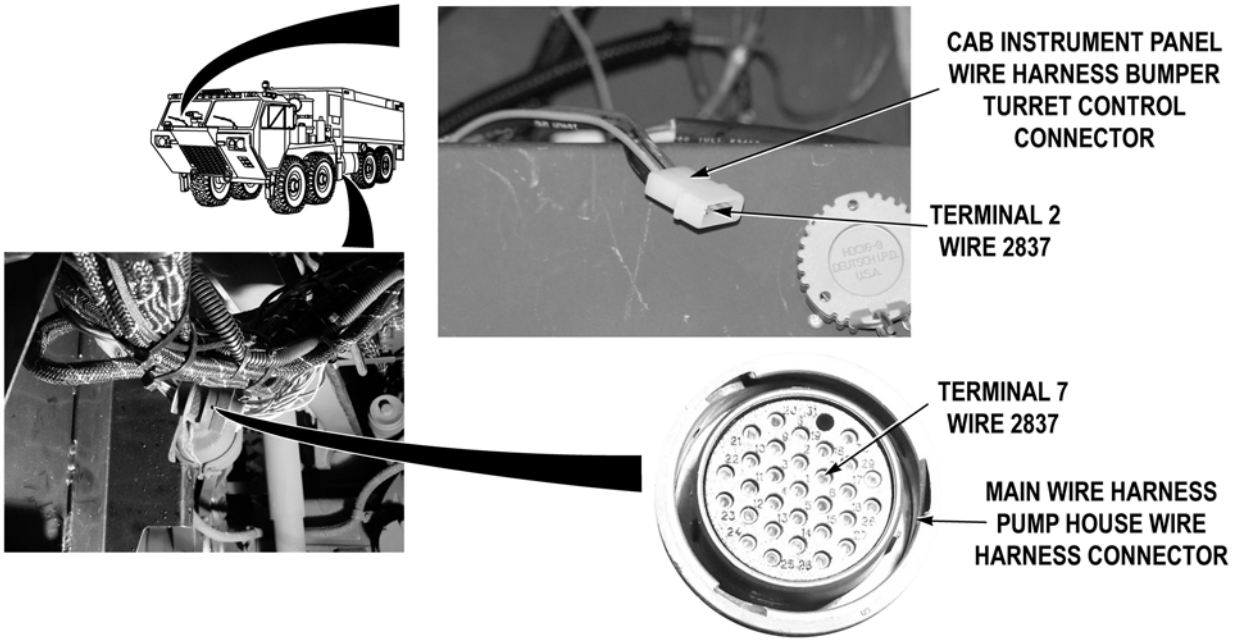
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 12. Release bumper turret control discharge switch (WP 0004). Install bumper turret control cover and tighten four screws. Disconnect main wire harness pump house wire harness connector. While an assistant pushes and holds bumper turret control discharge switch (WP 0004), with a test lead set, check for 22 to 28 VDC between main wire harness wire 2837 (gray) at main wire harness pump house wire harness connector, terminal 7 and a known good ground.

If 22 to 28 VDC are present, repair wire 2837 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

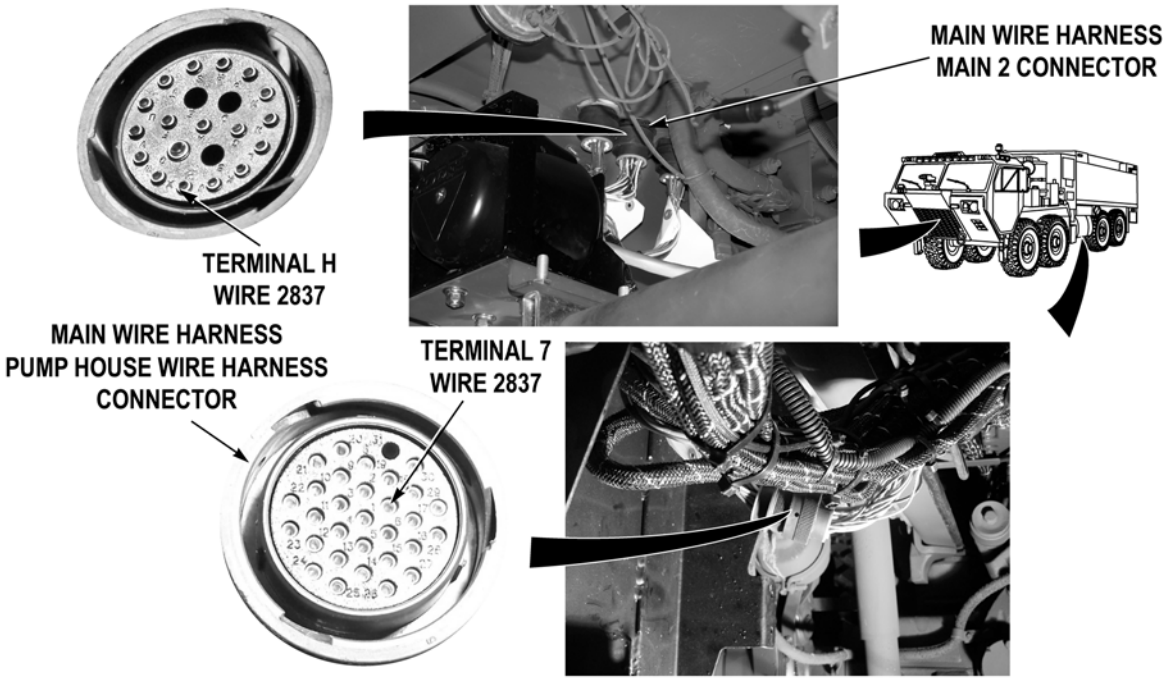
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Release bumper turret control discharge switch (WP 0004). Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel E (WP 0203). Disconnect cab instrument panel wire harness bumper turret control connector. With a test lead set, check for continuity across wire 2837 (gray) from cab instrument panel wire harness bumper turret control connector, terminal 2 to main wire harness pump house wire harness connector, terminal 7.

If there is continuity, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

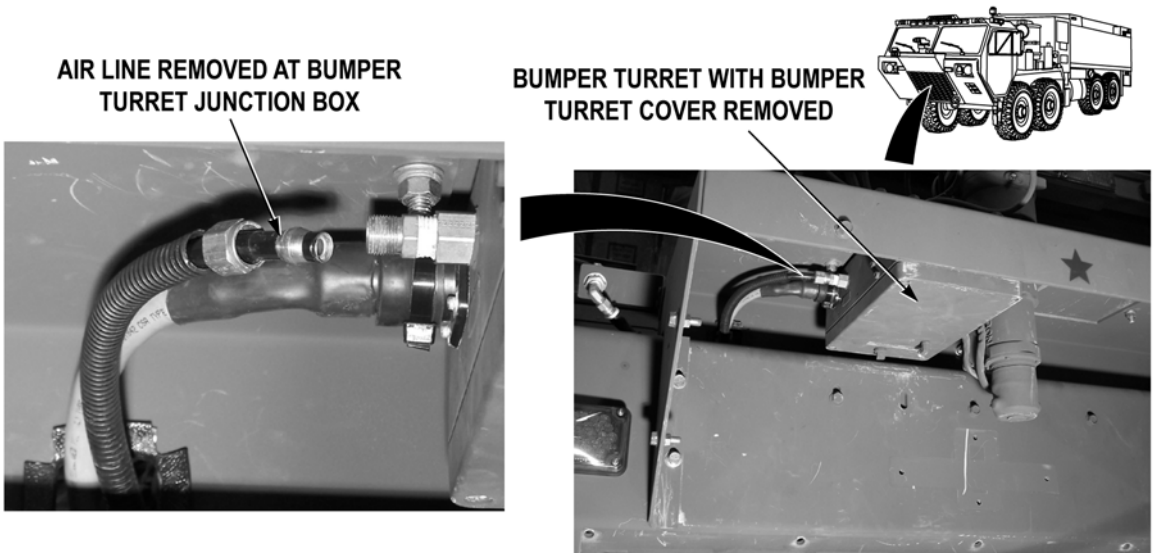


Step 14. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 2837 (gray) from main wire harness main 2 connector, terminal H to main wire harness pump house wire harness connector, terminal 7.

a. If there is continuity, repair wire 2837 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0270).

b. If there is no continuity, repair wire 2837 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.

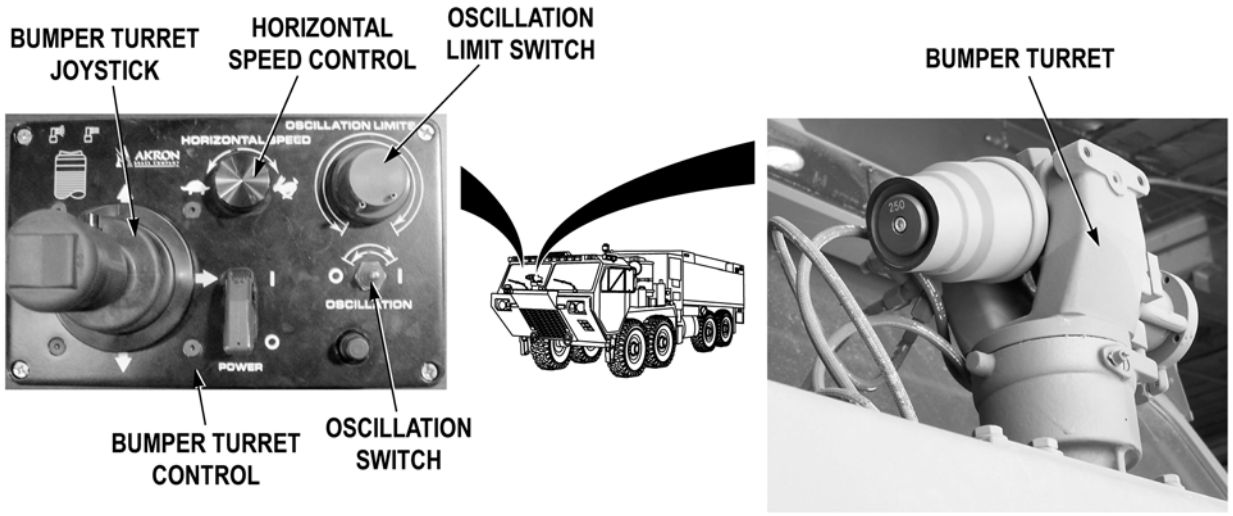
NOTE

Air pressure is checked by disconnecting air lines at bumper turret junction box and observing air pressure escaping from air line. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 15. Release bumper turret control discharge switch (WP 0004). Remove bumper turret cover (WP 0377). Disconnect air line at bumper turret junction box. Check if air pressure is present at bumper turret junction box.

If there is no air pressure, replace air line to bumper turret junction box (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Connect air line at bumper turret junction box. Set bumper turret control HORIZONTAL SPEED to fast (fully clockwise) position (WP 0004). While an assistant operates bumper turret control joystick to left and right positions (WP 0004), check if bumper turret rotates to driver side and passenger side of vehicle.

If bumper turret does not rotate, go to Step 71.

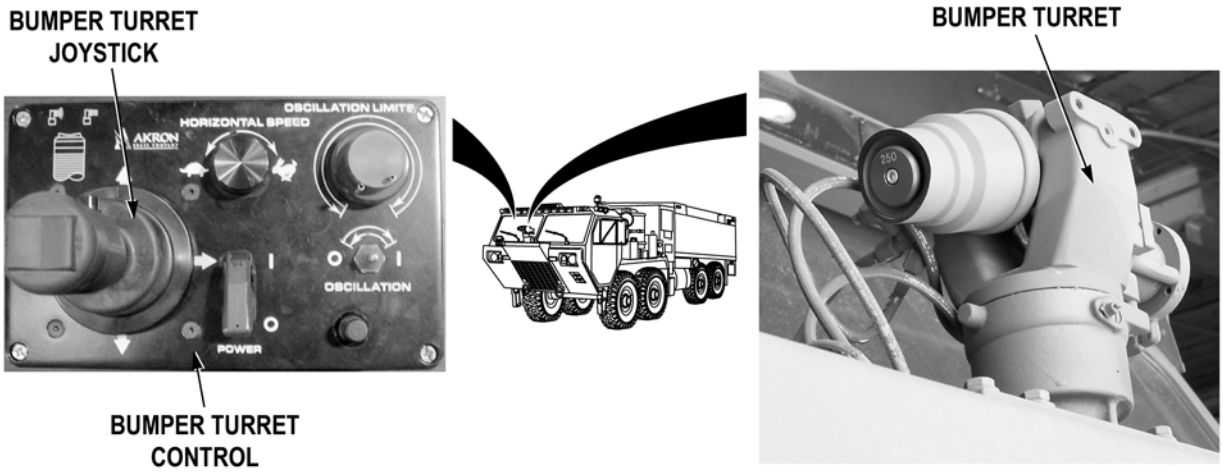
Step 17. Put bumper turret control OSCILLATION switch to **|** (on) position (WP 0004). Set bumper turret control OSCILLATION LIMITS control knobs to left and right limits for system operations check (WP 0004). Check if bumper turret oscillates to limits selected.

If bumper turret does not oscillate to limits selected or stops at hard stop, go to Step 62.

Step 18. While an assistant adjusts bumper turret control HORIZONTAL SPEED control (WP 0004), check if bumper turret oscillation speed varies when control is adjusted.

If bumper turret oscillation speed does not vary, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



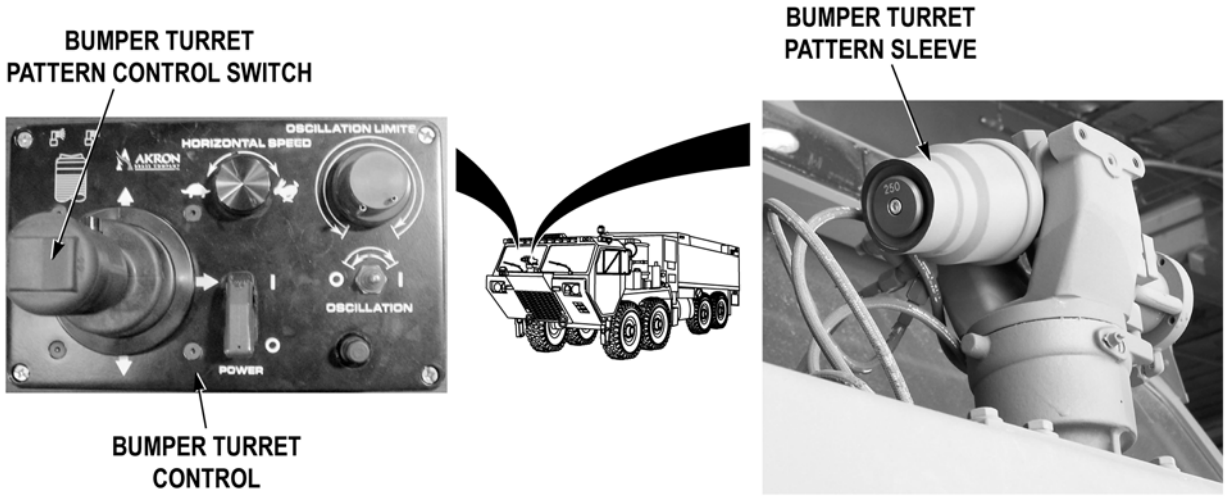
Step 19. Put bumper turret control OSCILLATION switch to O (off) position (WP 0004). While an assistant operates bumper turret control joystick in forward and rear positions (WP 0004), check if bumper turret raises and lowers.

If bumper turret does not raise and lower, go to Step 39.

Step 20. While an assistant operates bumper turret control joystick in forward and rear positions (WP 0004), check if bumper turret raises and lowers at a rate suitable for system operations.

If bumper turret does not raise and lower at a rate suitable for system operations, go to Step 61.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 21. Check bumper turret pattern sleeve for blockage and debris.

If bumper turret pattern sleeve is not free from blockage and debris, remove blockage and debris, and go to Step 22.

NOTE

Bumper turret pattern sleeve shifts from stream-to-fog/fog-to-stream positions with air pressure. Bumper turret pattern sleeve will shift from fog-to-stream at a slower rate as system water pressure is increased.

Step 22. While an assistant pushes bumper turret control pattern control switch (WP 0004), check if bumper turret pattern sleeve shifts to stream and fog positions.

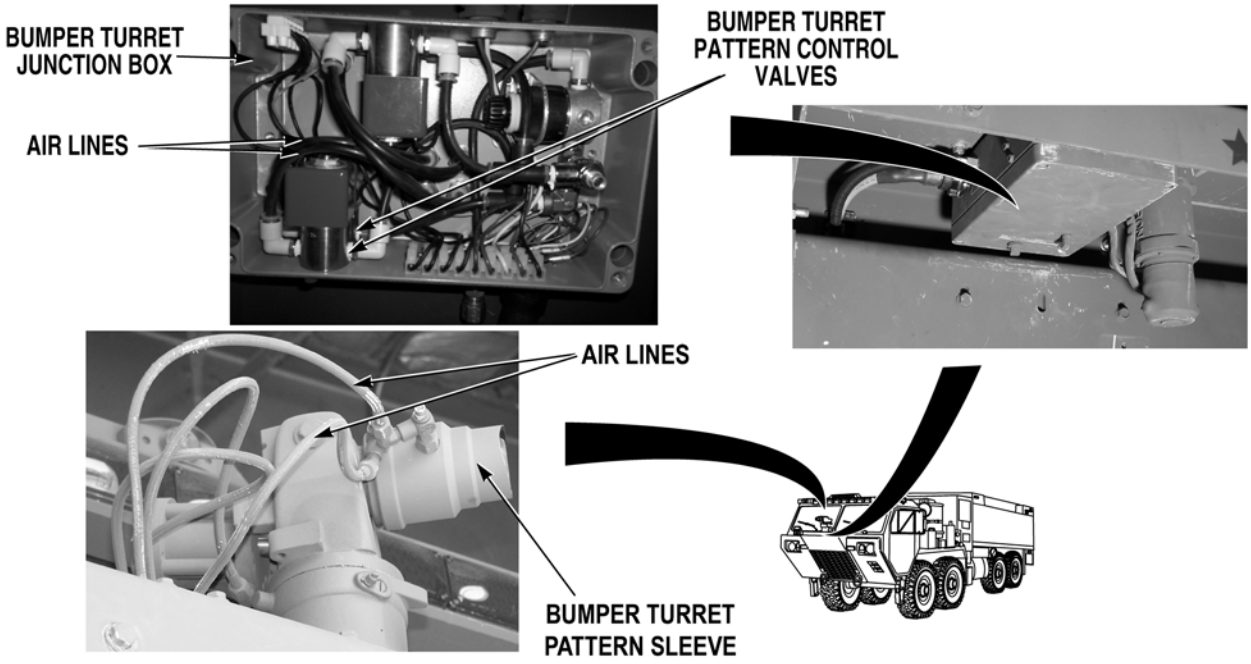
If bumper turret pattern sleeve does not shift to stream and fog positions, go to Step 24.

Step 23. While an assistant pushes bumper turret control pattern control switch (WP 0004), check if bumper turret pattern sleeve shifts to stream and fog positions at a rate suitable for system operations.

a. If bumper turret pattern sleeve shifts at a rate suitable for system operations, fault corrected.

b. If bumper turret pattern sleeve does not shift at a suitable rate for system operations, go to Step 38.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

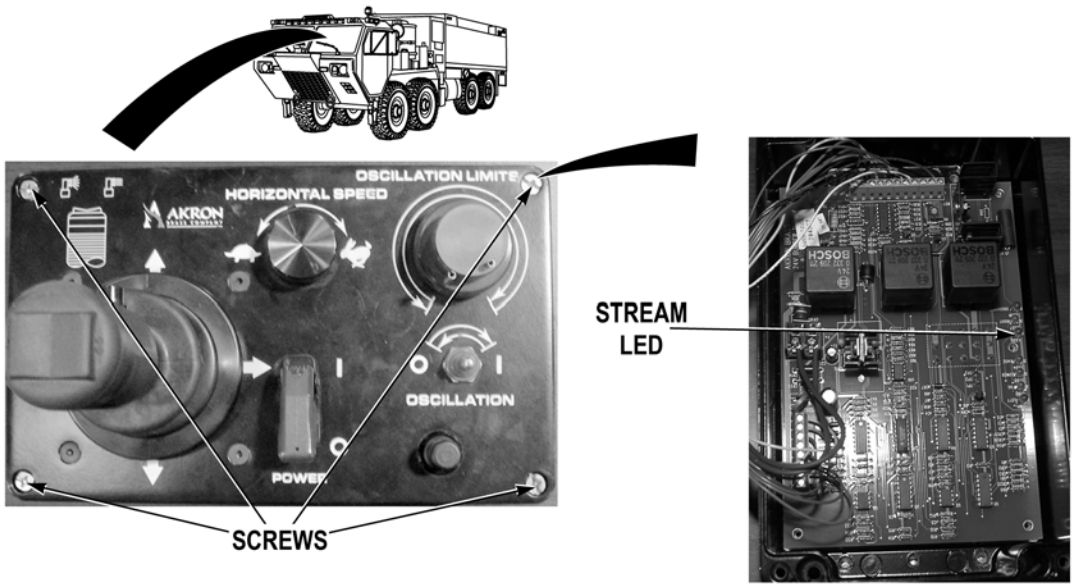
Step 24. Remove bumper turret junction box cover (WP 0378). While an assistant pushes bumper turret control pattern control switch (WP 0004), check air lines and fittings from bumper turret pattern control valves to bumper turret pattern sleeve for leaks, kinks, and damage.

If air lines and/or fittings leak, are kinked or are damaged, repair leaks or replace bumper turret air lines and/or fittings (WP 0380) or bumper turret junction box air lines and/or fittings (WP 0378).

Step 25. While an assistant pushes bumper turret control pattern control switch to fog position (WP 0004). Check if bumper turret pattern sleeve shifts to fog (retracted) position.

If bumper turret pattern sleeve does not shift to fog (retracted) position, go to Step 32.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



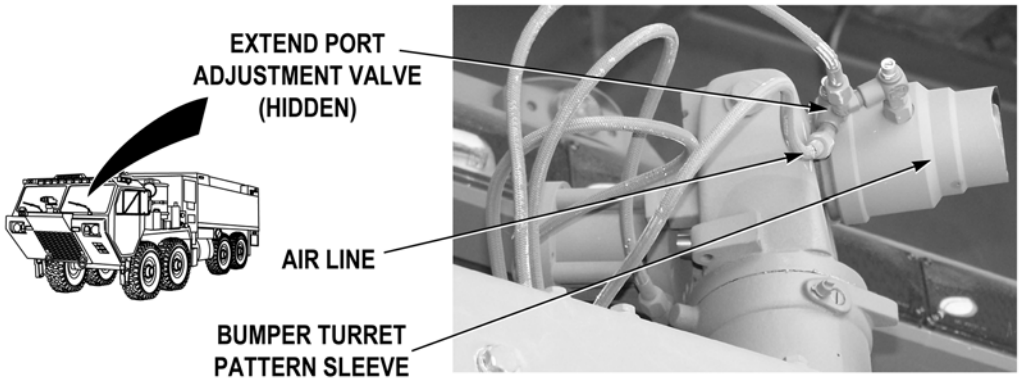
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 26. Loosen four screws and remove bumper turret control cover. Do not disconnect wires. While pushing bumper turret control pattern control switch to stream position (WP 0004), check if bumper turret control STREAM LED illuminates.

If bumper turret control STREAM LED does not illuminate, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

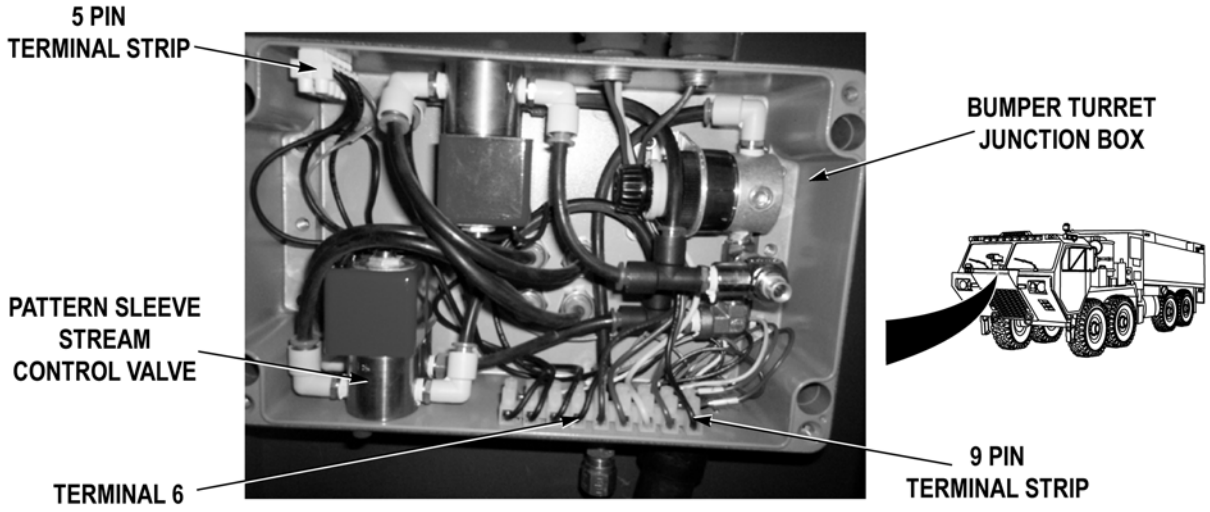
NOTE

Air pressure is checked by disconnecting air line at bumper turret pattern sleeve and observing air pressure escaping from air line when bumper turret control is activated.

Step 27. Install bumper turret control cover and tighten four screws. Disconnect air line at bumper turret pattern sleeve extend port. Do not remove adjustment valve from sleeve. While an assistant pushes bumper turret control pattern control switch to stream position (WP 0004), check if air pressure is present at bumper turret pattern sleeve extend port. Connect air line at bumper turret pattern sleeve extend port.

If air pressure is present, go to Step 38.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 28. Connect air line at bumper turret pattern sleeve extend port. While an assistant pushes bumper turret control pattern control switch to stream position (WP 0004), check for 22 to 28 VDC between stream wire (black) at bumper turret junction box 9 pin terminal strip, terminal 6 and a known good ground.

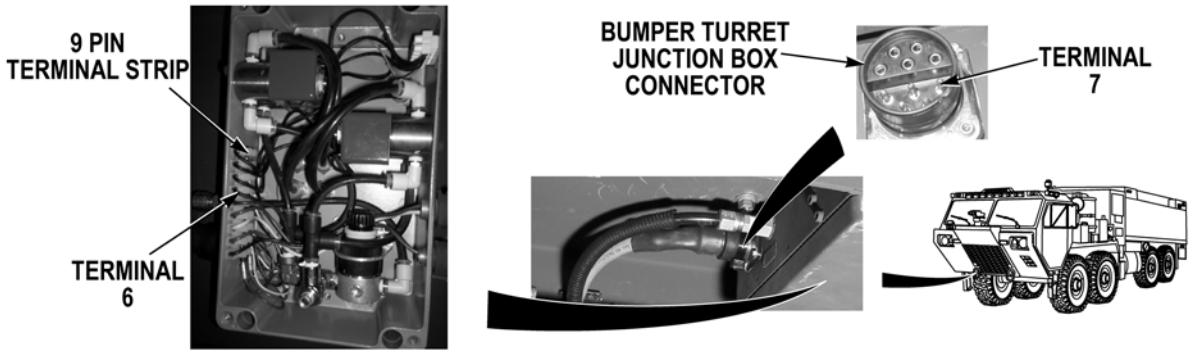
If 22 to 28 VDC are not present, go to Step 30.

Step 29. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Check connections at bumper turret junction box 9 pin and 5 pin terminal strips for loose connections.

a. If connections are loose, tighten loose connections (WP 0378).

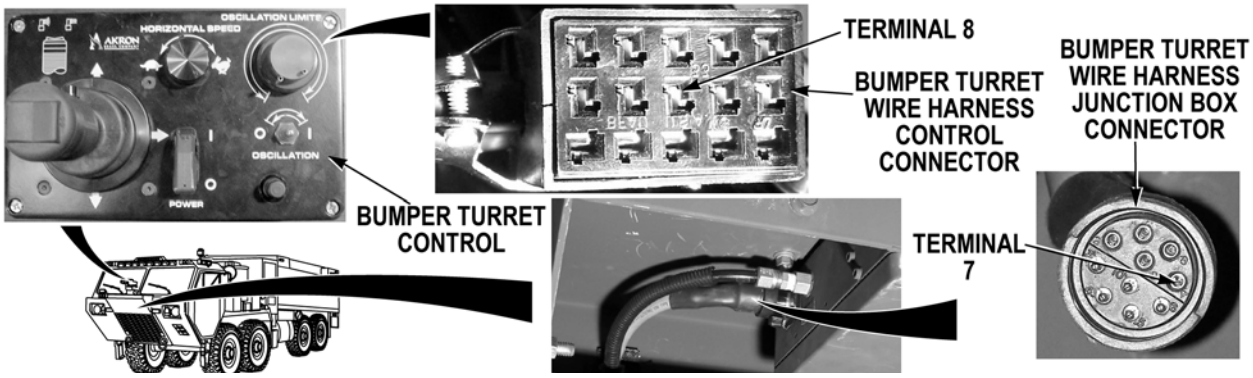
b. If connections are not loose, replace bumper turret junction box pattern sleeve stream control valve (WP 0378).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 30. Put bumper turret control POWER switch to ○ (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box stream wire (black) from bumper turret junction box connector, terminal 7 to bumper turret junction box 9 pin terminal strip, terminal 6.

If there is no continuity, repair bumper turret junction box stream wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

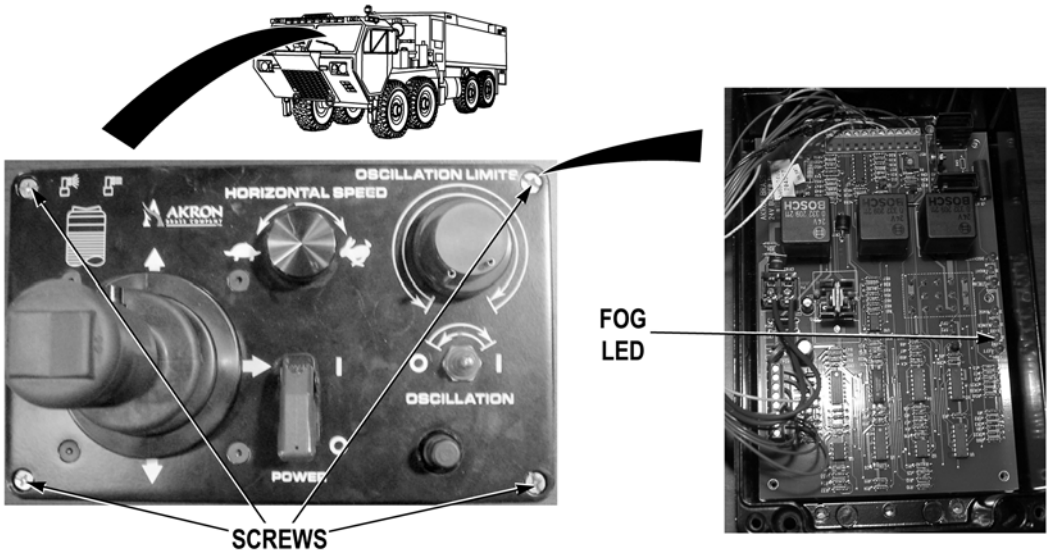


Step 31. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness stream wire (black) from bumper turret wire harness bumper turret control connector, terminal 8 to bumper turret wire harness junction box connector, terminal 7.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness stream wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



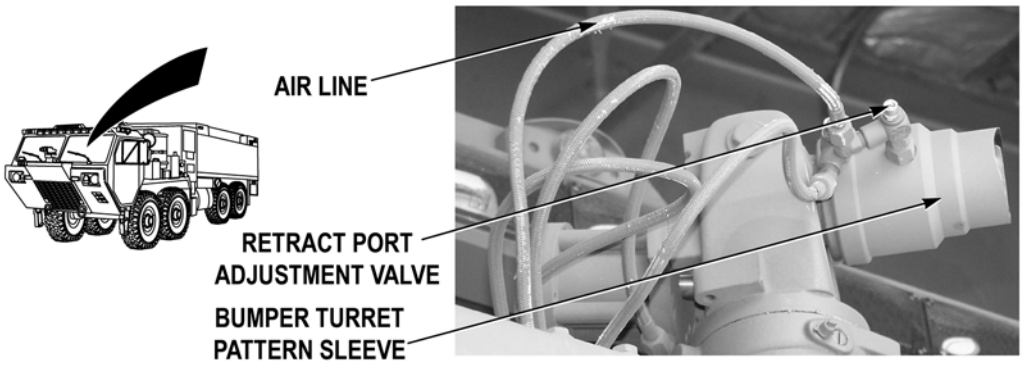
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 32. Loosen four screws and remove bumper turret control cover. Do not disconnect wires. While pushing bumper turret control pattern control switch to fog position (WP 0004), check if bumper turret control FOG LED illuminates.

If bumper turret control FOG LED does not illuminate, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

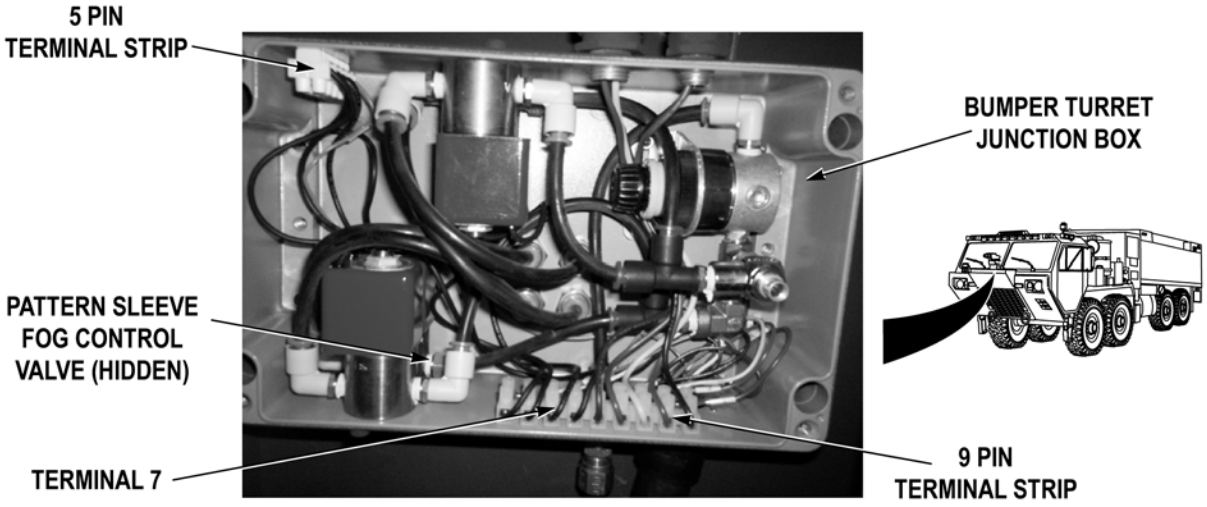
NOTE

Air pressure is checked by disconnecting air line at bumper turret pattern sleeve and observing air pressure escaping from air line, when bumper turret control is activated.

Step 33. Install bumper turret control cover and tighten four screws. Disconnect air line at bumper turret pattern sleeve retract port. Do not remove adjustment valve from sleeve. While an assistant pushes bumper turret control pattern control switch to fog position (WP 0004), check if air pressure is present at bumper turret pattern sleeve retract port. Connect air line at bumper turret pattern sleeve retract port.

If air pressure is present, go to Step 38.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 34. While an assistant pushes bumper turret control pattern control switch to fog position (WP 0004), check for 22 to 28 VDC between fog wire (black) at bumper turret junction box 9 pin terminal strip, terminal 7 and a known good ground.

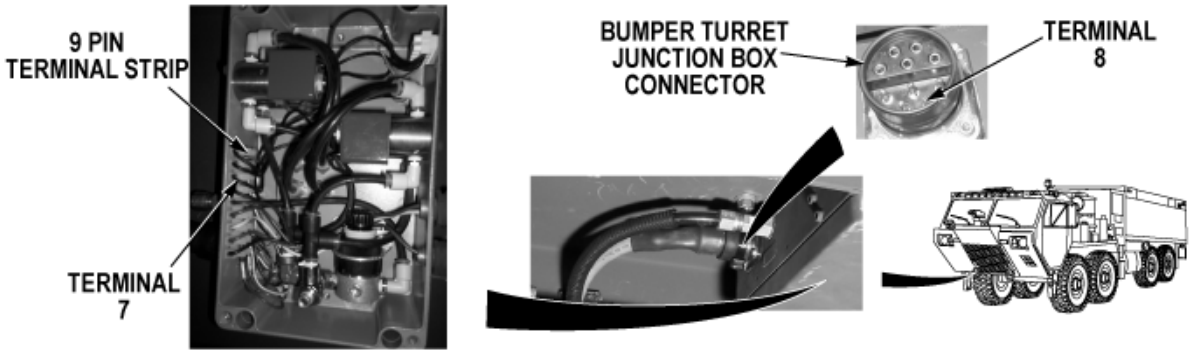
If 22 to 28 VDC are not present, go to Step 36.

Step 35. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Check connections at bumper turret junction box 9 pin and 5 pin terminal strips for loose connections.

a. If connections are loose, tighten loose connections (WP 0378).

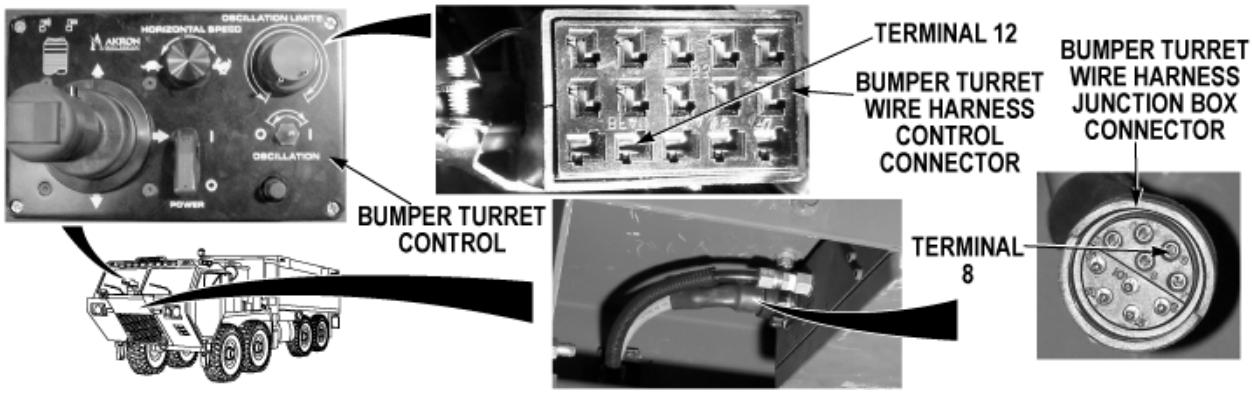
b. If connections are not loose, replace bumper turret junction box pattern sleeve fog control valve (WP 0378).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 36. Put bumper turret control POWER switch to ○ (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box fog wire (black) from bumper turret junction box connector, terminal 8 to bumper turret junction box 9 pin terminal strip, terminal 7.

If there is no continuity, repair bumper turret junction box fog wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).



Step 37. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness fog wire (black) from bumper turret wire harness bumper turret control connector, terminal 12 to bumper turret wire harness junction box connector, terminal 8.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness fog wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

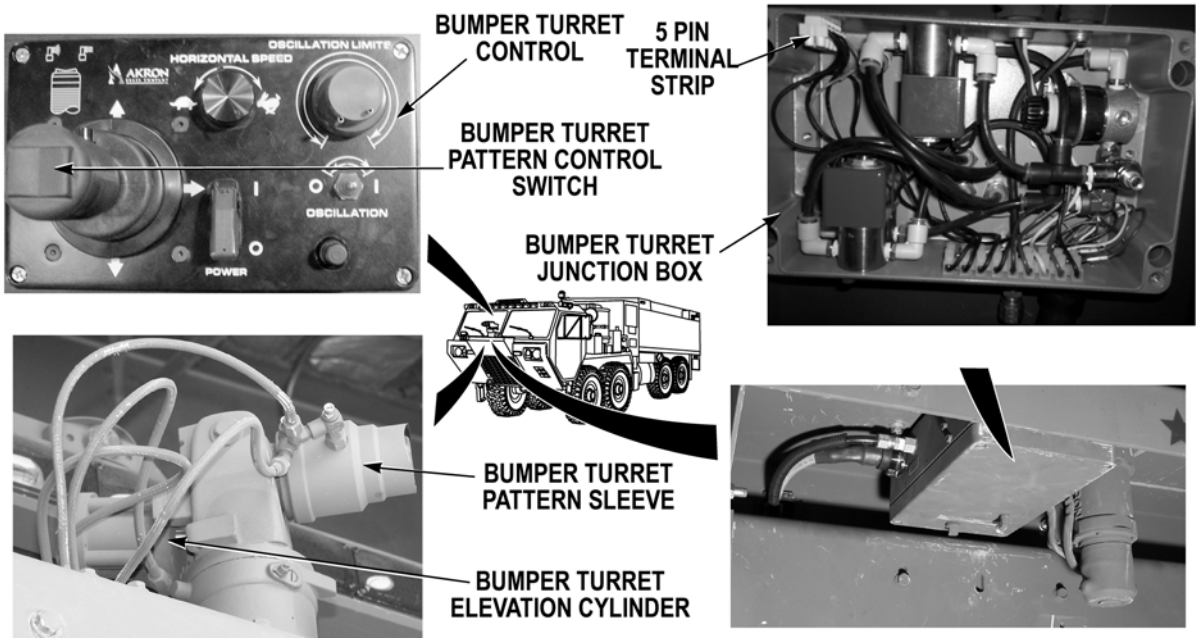
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 38. Adjust bumper turret (WP 0130). Check if bumper turret pattern sleeve shift rate can be adjusted so pattern sleeve shifts to stream and fog positions at a rate suitable for system operations.

a. If bumper turret pattern shift rate adjusts to a rate suitable for system operations, fault corrected.

b. If bumper turret pattern shift rate can not be adjusted, replace bumper turret pattern sleeve (WP 0380).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 39. While an assistant pushes bumper turret control pattern control switch (WP 0004), check if bumper turret pattern sleeve shifts to stream and fog positions.

If bumper turret pattern sleeve shifts to stream and fog positions, go to Step 44.

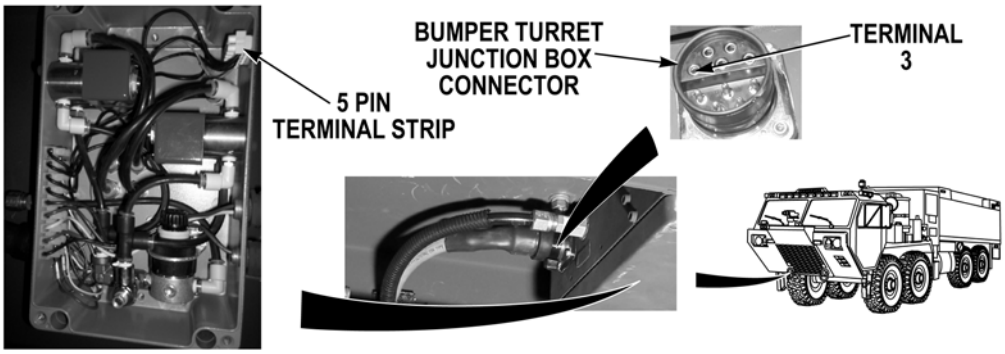
Step 40. Put bumper turret control POWER switch to ○ (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove bumper turret junction box cover (WP 0378). Check connections at bumper turret junction box 5 pin terminal strip for loose connections.

If connections are loose, tighten loose connections (WP 0378).

Step 41. Check for continuity across bumper turret junction box ground wire (black) from bumper turret junction box 5 pin terminal strip to a known good ground.

If there is continuity, replace bumper turret junction box air regulator (WP 0378).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 42. Disconnect bumper turret wire harness junction box connector. Check for continuity across bumper turret junction box ground wire (black) from bumper turret junction box connector, terminal 3 to bumper turret junction box 5 pin terminal strip.

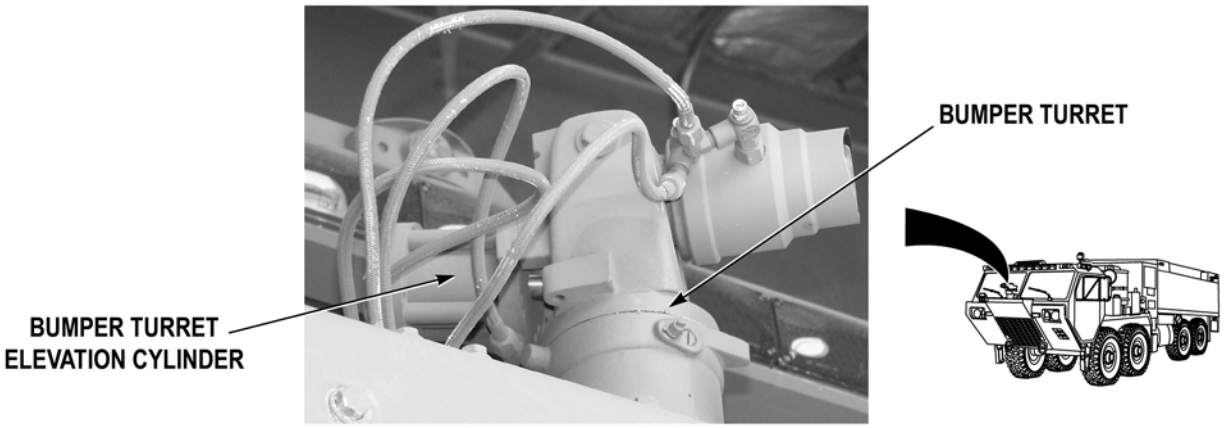
If there is no continuity, repair bumper turret junction box ground wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

Step 43. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness ground wire (black) from bumper turret wire harness bumper turret control connector, terminals 5, 10, and 15 to bumper turret wire harness bumper turret junction box connector, terminal 3.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness ground wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 44. Check bumper turret elevation cylinder for blockage and debris.

If bumper turret elevation cylinder is not free from blockage and debris, remove blockage and debris and go to Step 45.

Step 45. While an assistant operates bumper turret control joystick in forward and rear positions (WP 0004), check if bumper turret raises and lowers.

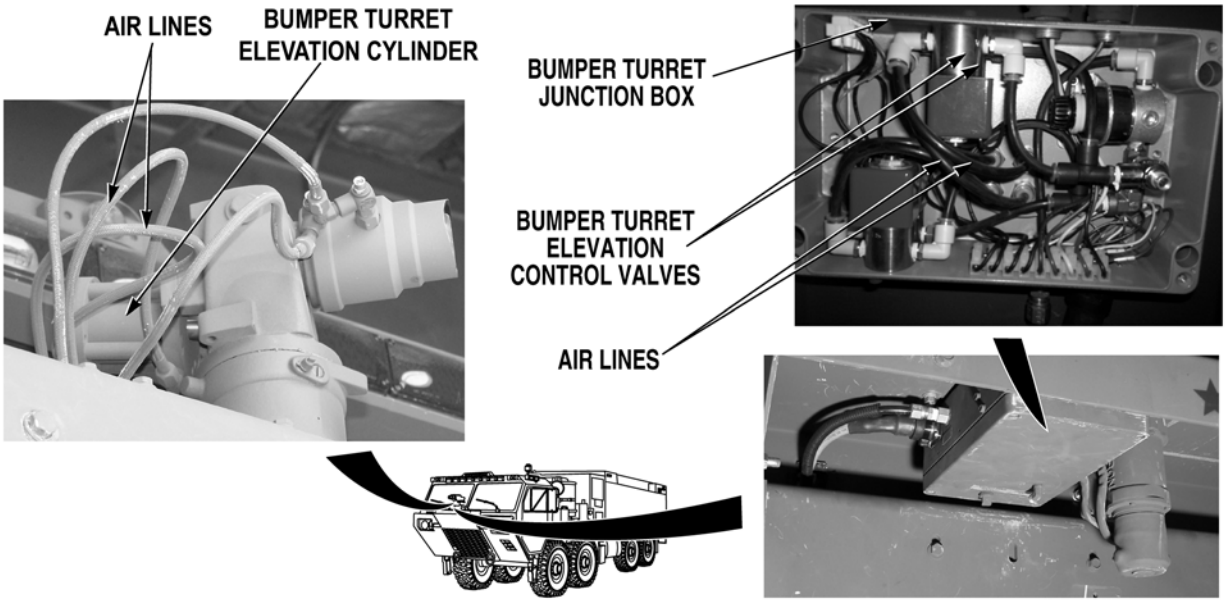
If bumper turret does not raise and lower, go to Step 47.

Step 46. While an assistant operates bumper turret control joystick in forward and rear positions (WP 0004), check if bumper turret raises and lowers at a rate suitable for system operations.

a. If bumper turret raises and lowers at a rate suitable for system operations, fault corrected.

b. If bumper turret does not raise and lower at a suitable rate for system operations, go to Step 61.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

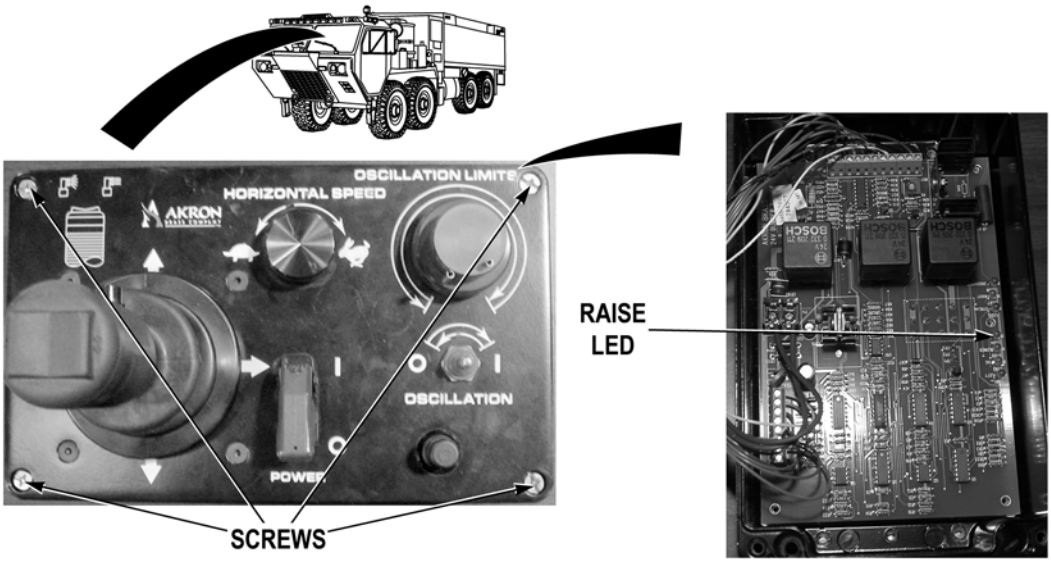
Step 47. Remove bumper turret junction box cover (WP 0378). While an assistant operates bumper turret control joystick in forward and rear positions (WP 0004), check air lines and fittings from bumper turret elevation control valves to bumper turret elevation cylinder for leaks, kinks, and damage.

If air lines and/or fittings leak, are kinked, or are damaged, repair leaks or replace bumper turret air lines and/or fittings (WP 0380) or bumper turret junction box air line and/or fittings (WP 0378).

Step 48. While an assistant operates bumper turret control joystick to forward position (WP 0004). Check if bumper turret shifts to lowered position.

If bumper turret does not shift to lowered position, go to Step 55.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



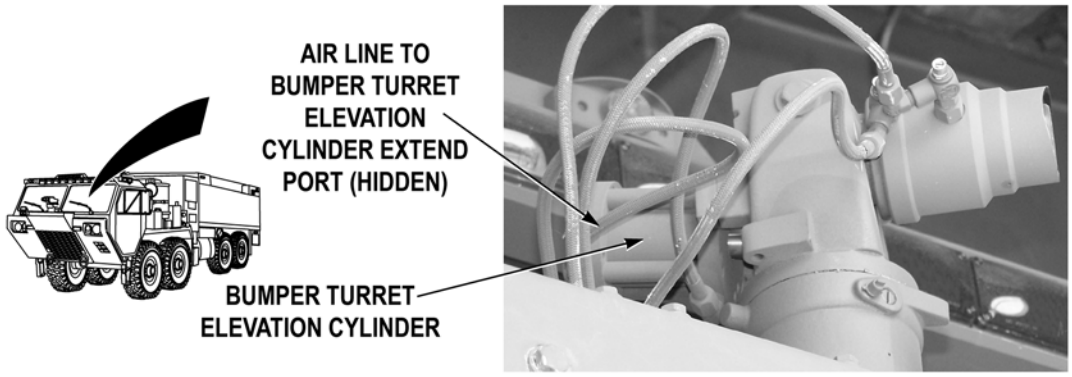
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 49. Loosen four screws and remove bumper turret control cover. Do not disconnect wires. While operating bumper turret control joystick to rear position (WP 0004), check if bumper turret control RAISE LED illuminates.

If bumper turret control RAISE LED does not illuminate, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

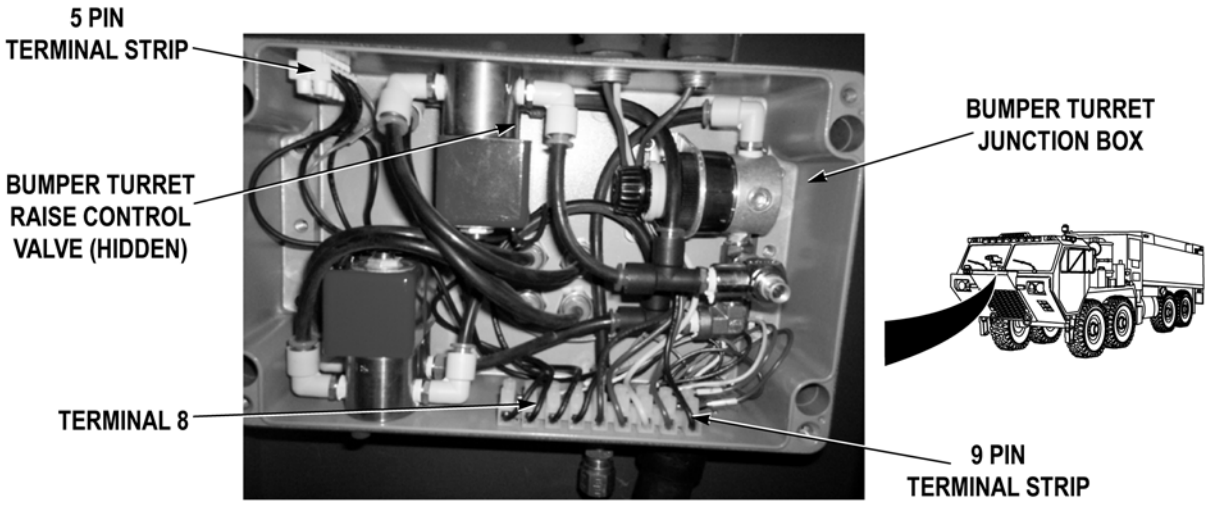
NOTE

Air pressure is checked by disconnecting air line at bumper turret elevation cylinder and observing air pressure escaping from air line, when bumper turret control is activated.

Step 50. Install bumper turret control cover and tighten four screws. Disconnect air line at bumper turret elevation cylinder extend port. While an assistant operates bumper turret joystick to rear position (WP 0004), check if air pressure is present at bumper turret elevation cylinder extend port.

If air pressure is present, connect air line at bumper turret elevation cylinder extend port and go to Step 61.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 51. Connect air line at bumper turret elevation cylinder extend port. While an assistant operates bumper turret control joystick to rear position (WP 0004), check for 22 to 28 VDC between bumper turret raise wire (black) at bumper turret junction box 9 pin terminal strip, terminal 8 and a known good ground.

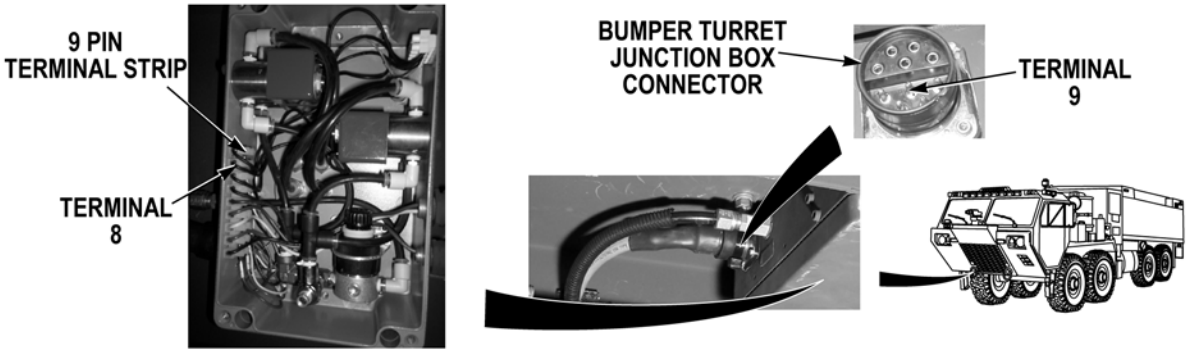
If 22 to 28 VDC are not present, go to Step 53.

Step 52. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Check connections at bumper turret junction box 9 pin and 5 pin terminal strips for loose connections.

a. If connections are loose, tighten loose connections (WP 0378).

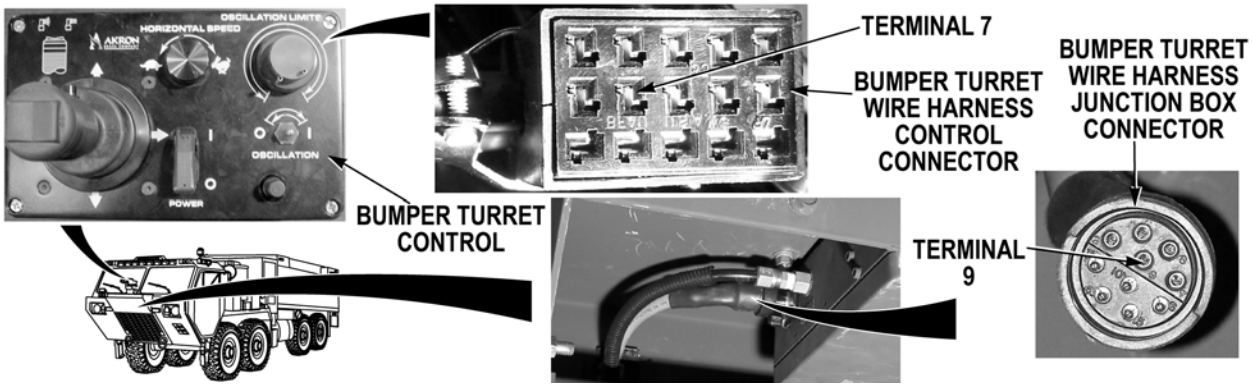
b. If connections are not loose, replace bumper turret raise control valve (WP 0378).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 53. Put bumper turret control POWER switch to ○ (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box raise wire (black) from bumper turret junction box connector, terminal 9 to bumper turret junction box 9 pin terminal strip, terminal 8.

If there is no continuity, repair bumper turret junction box raise wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

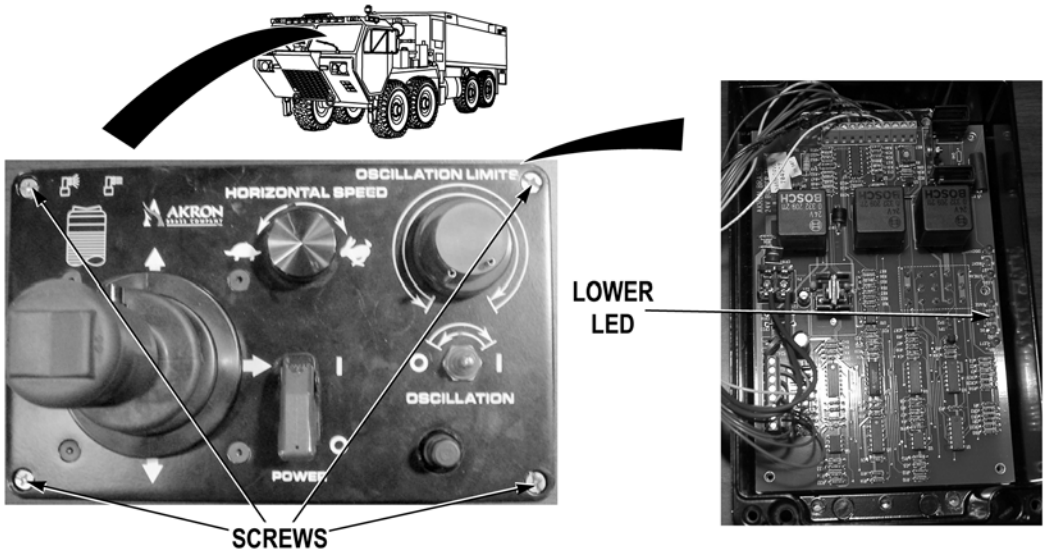


Step 54. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness raise wire (black) from bumper turret wire harness bumper turret control connector, terminal 7 to bumper turret wire harness bumper turret junction box connector, terminal 9.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness raise wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



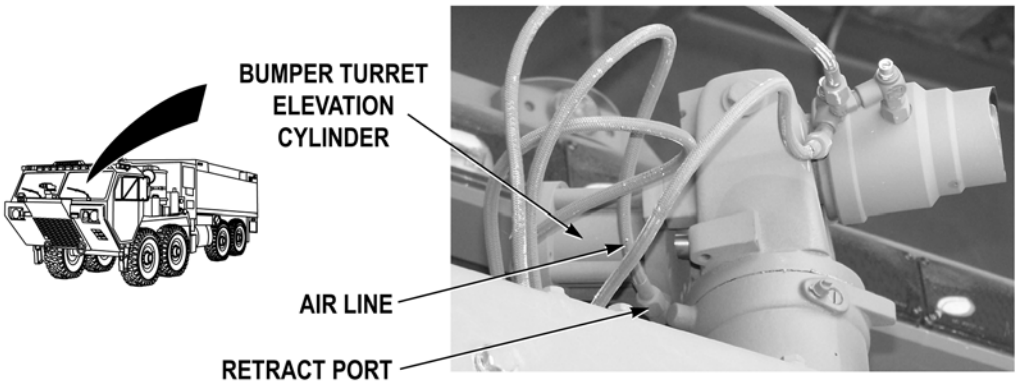
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 55. Loosen four screws and remove bumper turret control cover. Do not disconnect wires. While operating bumper turret control joystick to forward position (WP 0004), check if bumper turret control LOWER LED illuminates.

If bumper turret control LOWER LED does not illuminate, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

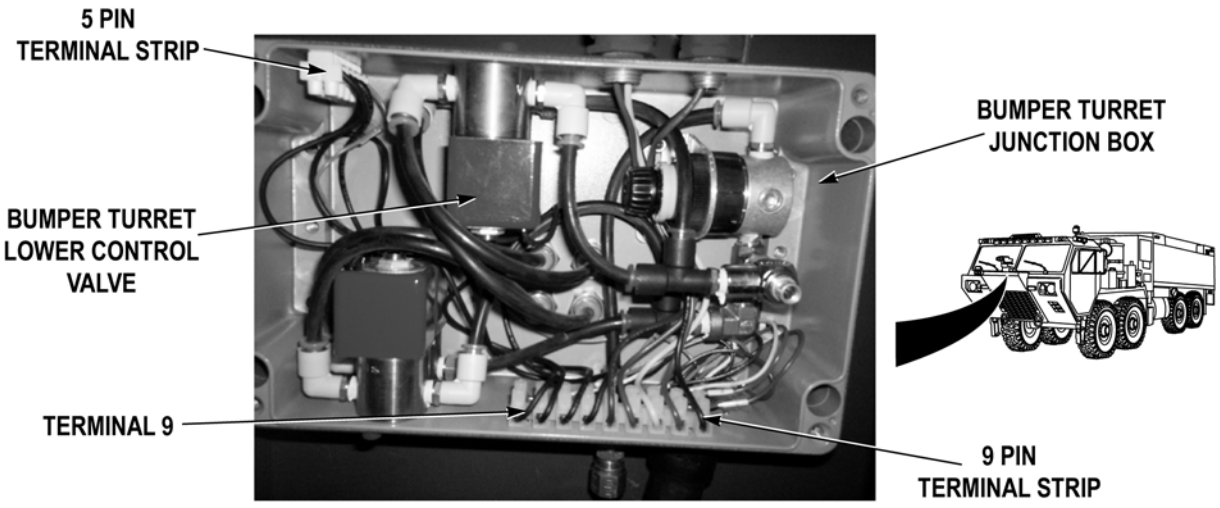
NOTE

Air pressure is checked by disconnecting air line at bumper turret elevation cylinder and observing air pressure escaping from air line when bumper turret control is activated.

Step 56. Install bumper turret control cover and tighten four screws. Disconnect air line at bumper turret elevation cylinder retract port. While an assistant operates bumper turret control joystick to forward position (WP 0004), check if air pressure is present at bumper turret elevation cylinder retract port.

If air pressure is present, connect air line at bumper turret elevation cylinder retract port and go to Step 61.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 57. Connect air line at bumper turret elevation cylinder retract port. While an assistant operates bumper turret control joystick to forward position (WP 0004), check for 22 to 28 VDC between bumper turret lower wire (black) at bumper turret junction box 9 pin terminal strip, terminal 9 and a known good ground.

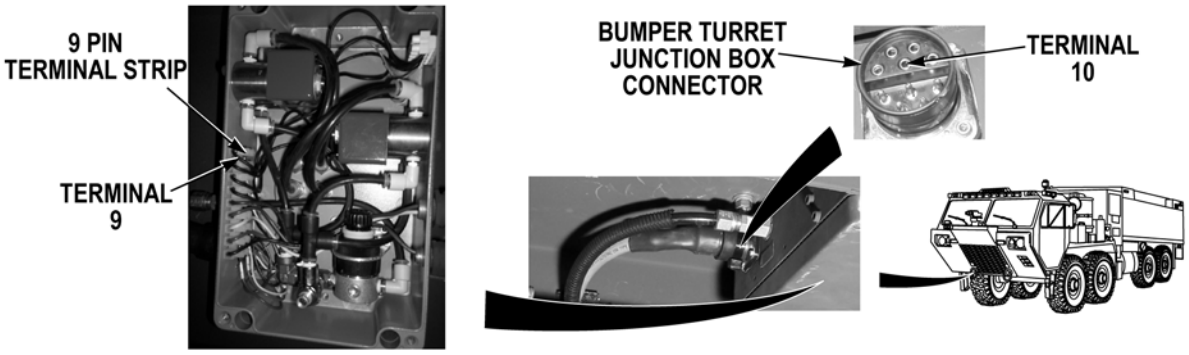
If 22 to 28 VDC are not present, go to Step 59.

Step 58. Put bumper turret control POWER switch to ○ (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Check connections at bumper turret junction box 9 pin and 5 pin terminal strips for loose connections.

a. If connections are loose, tighten loose connections (WP 0378).

b. If connections are not loose, replace bumper turret lower control valve (WP 0378).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 59. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box lower wire (black) from bumper turret junction box connector, terminal 10 to bumper turret junction box 9 pin terminal strip, terminal 9.

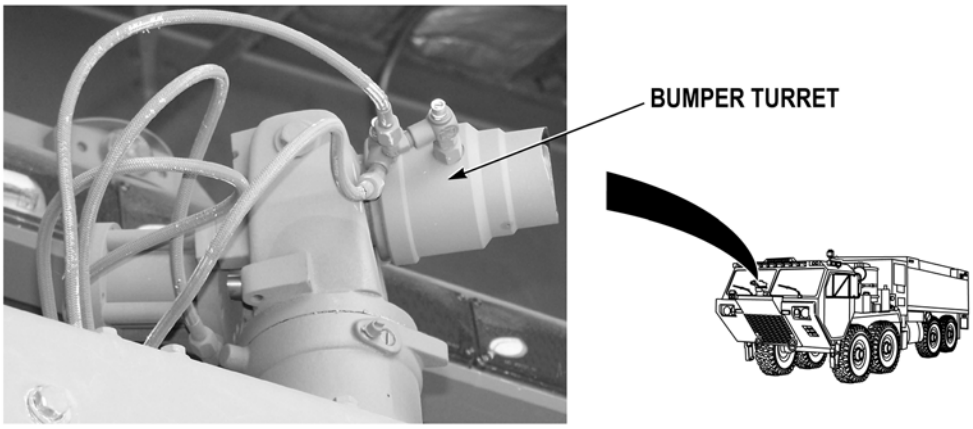
If there is no continuity, repair bumper turret junction box lower wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

Step 60. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness lower wire (black) from bumper turret wire harness bumper turret control connector, terminal 11 to bumper turret wire harness bumper turret junction box connector, terminal 10.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness lower wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

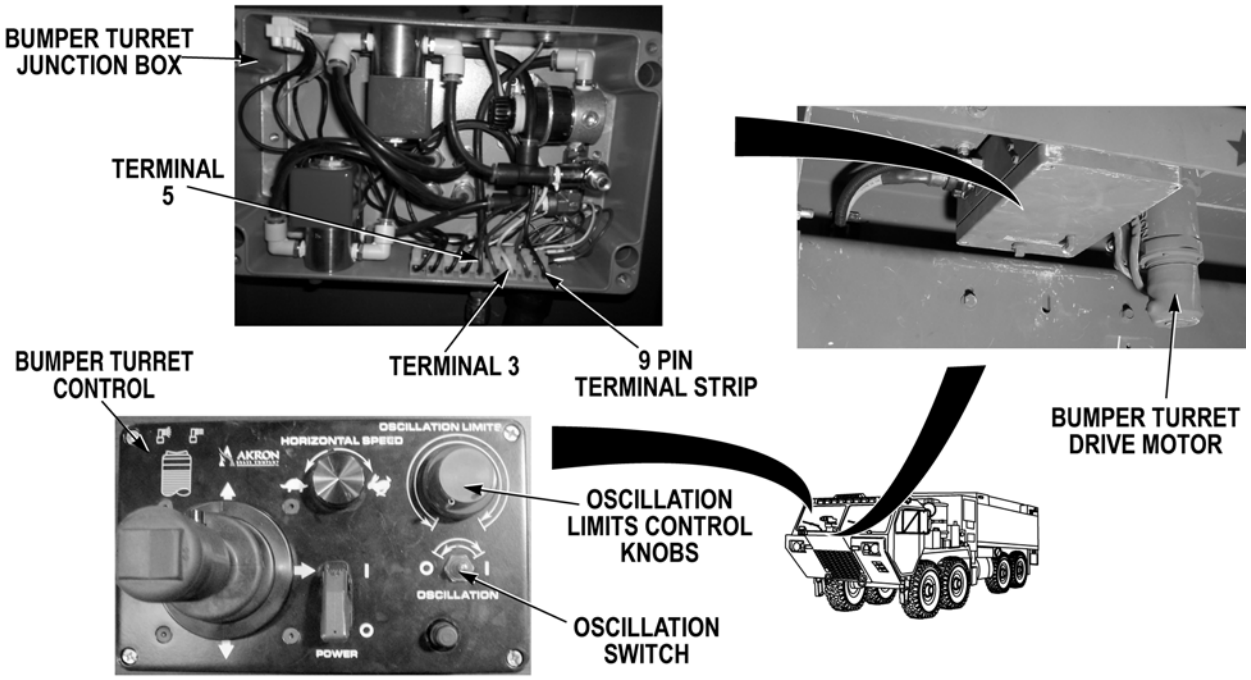
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 61. If installed, remove bumper turret junction box cover (WP 0378). Adjust bumper turret (WP 0130). Check if bumper turret elevation rate can be adjusted so elevation shifts to raised and lowered positions at a rate suitable for system operations.

a. If bumper turret elevation shift rate adjusts to a rate suitable for system operations, fault corrected.

b. If bumper turret elevation shift rate can not be adjusted, replace bumper turret junction box flow control valve (WP 0378).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

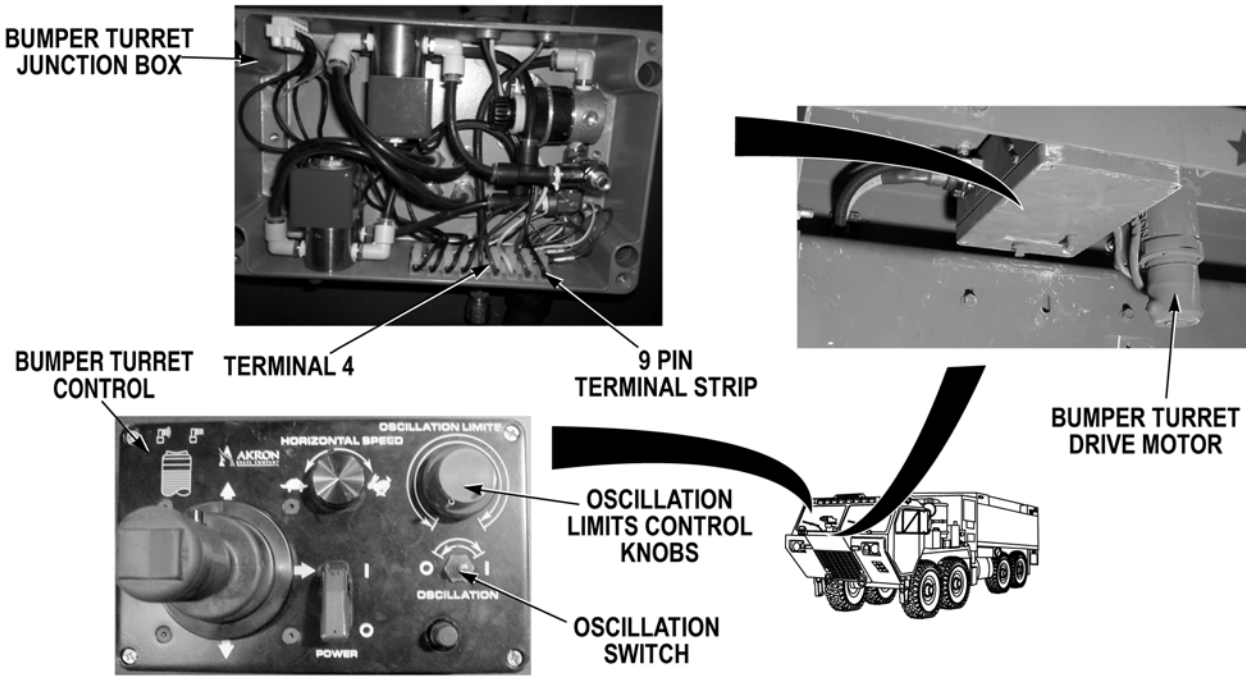
Step 62. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove bumper turret junction box cover (WP 0378). Check for continuity across bumper turret position sensor ground wire (blue) from bumper turret junction box 9 pin terminal strip, terminal 5 to a known good ground.

If there is no continuity, go to Step 69.

Step 63. Push battery disconnect switch to on position (WP 0007). Put bumper turret control POWER switch to **|** (on) position. Put OSCILLATION switch to **|** (on) position (WP 0004). Set OSCILLATION LIMITS control knobs to maximum left and right limits (WP 0004). Check for 7 to 9 VDC between bumper turret position sensor power wire (yellow) at bumper turret junction box 9 pin terminal strip, terminal 3 and a known good ground.

If 7 to 9 VDC are not present, go to Step 67.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



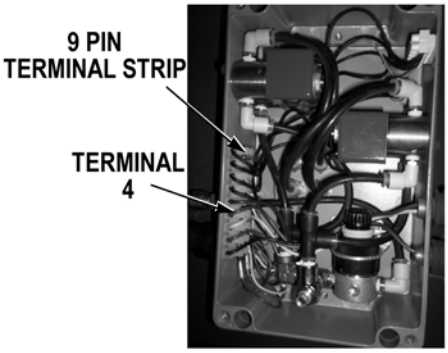
NOTE

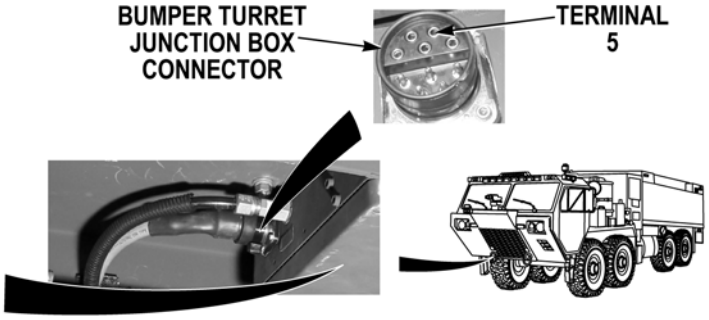
Voltage in Step 64 will vary between 0 and 7 VDC as bumper turret rotates from left limit to right limit and right limit to left limit.

Step 64. Check if voltage is between 0 to 7 VDC between bumper turret position sensor signal wire (green) at bumper turret junction box 9 pin terminal strip, terminal 4 and a known good ground as bumper turret rotates.

If 0 to 7 VDC are not present, replace bumper turret drive motor (WP 0380).

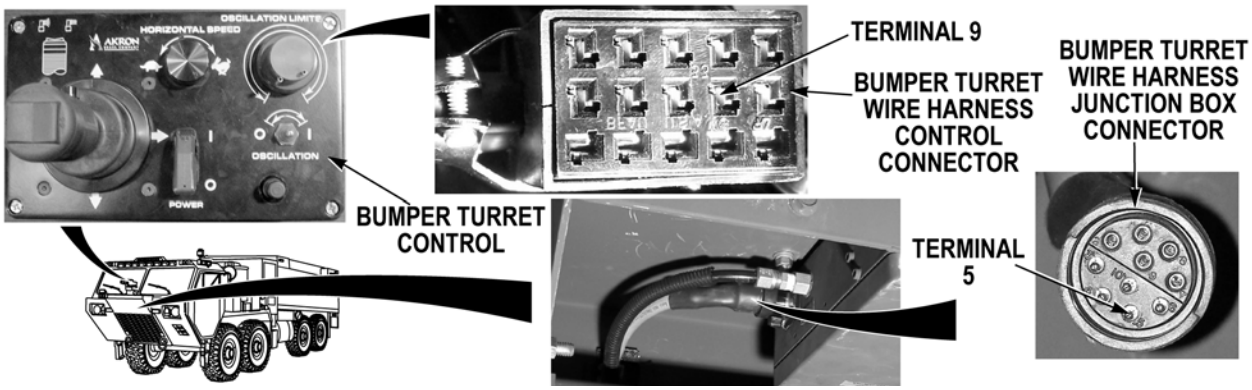
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





Step 65. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box position sensor signal wire (green) from bumper turret junction box connector, terminal 5 to bumper turret junction box 9 pin terminal strip, terminal 4.

If there is no continuity, repair bumper turret junction box position sensor signal wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

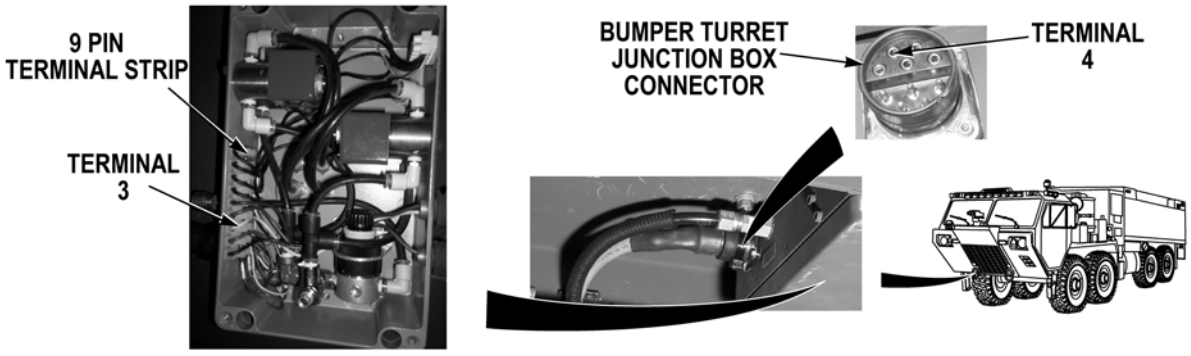


Step 66. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness position sensor signal wire (green) from bumper turret wire harness bumper turret control connector, terminal 9 to bumper turret wire harness bumper turret junction box connector, terminal 5.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness position sensor signal wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 67. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box position sensor power wire (yellow) from bumper turret junction box connector, terminal 4 to bumper turret junction box 9 pin terminal strip, terminal 3.

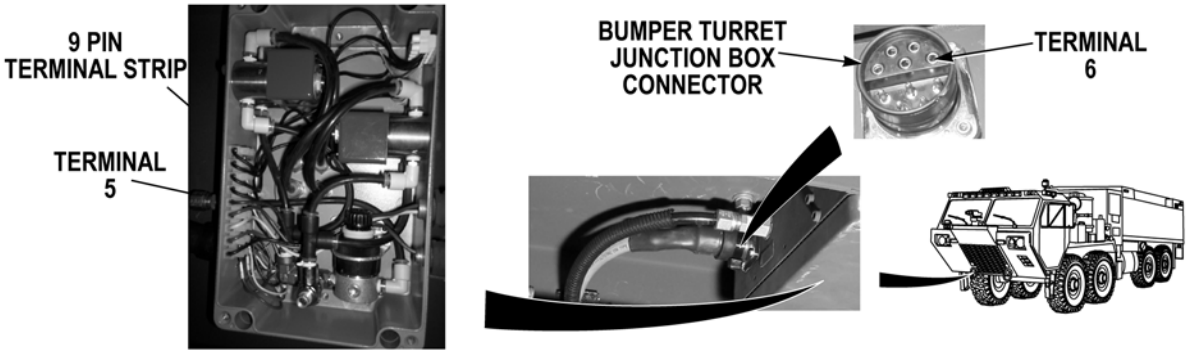
If there is no continuity, repair bumper turret junction box position sensor power wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

Step 68. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness position sensor power wire (yellow) from bumper turret wire harness bumper turret control connector, terminal 14 to bumper turret wire harness bumper turret junction box connector, terminal 4.

a. If there is continuity, replace bumper turret control (WP 0376).

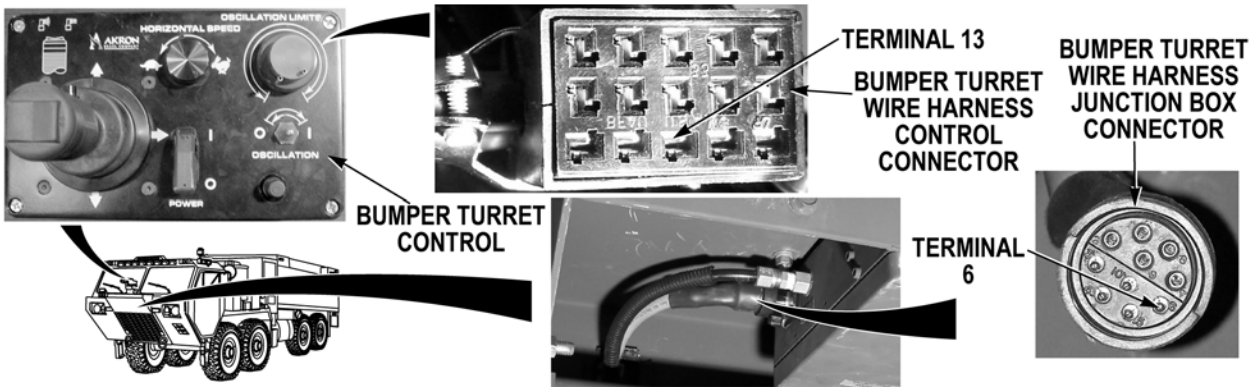
b. If there is no continuity, repair bumper turret wire harness position sensor power wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 69. Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box position sensor ground wire (blue) from bumper turret junction box connector, terminal 6 to bumper turret junction box 9 pin terminal strip, terminal 5.

If there is no continuity, repair bumper turret junction box position sensor ground wire in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

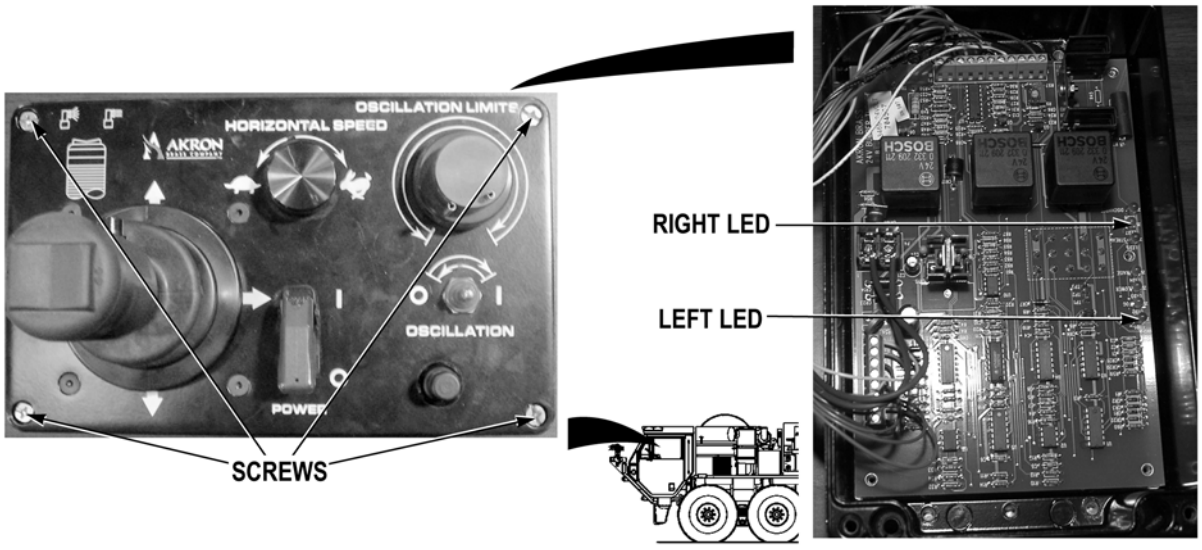


Step 70. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness position sensor ground wire (blue) from bumper turret wire harness bumper turret control connector, terminal 13 to bumper turret wire harness bumper turret junction box connector, terminal 6.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness position sensor ground wire in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

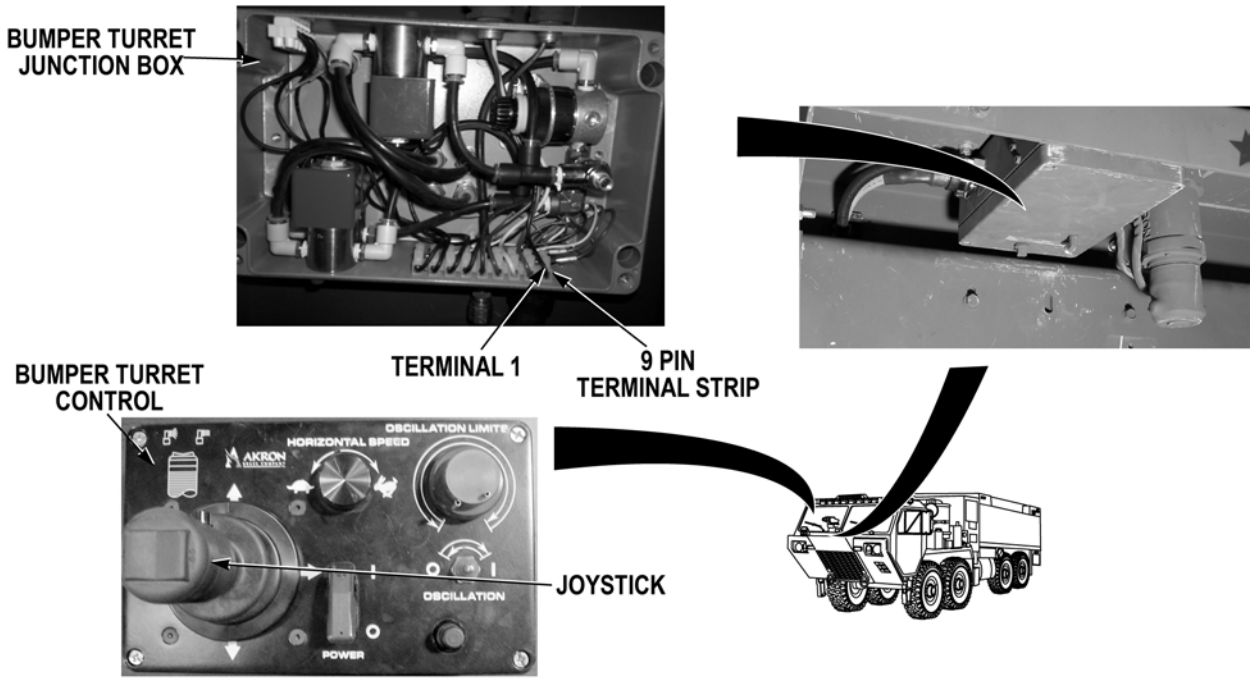
Step 71. Loosen four screws and remove bumper turret control cover. Do not disconnect wires. While operating bumper turret control joystick to right (passenger side) position (WP 0004), check if bumper turret control RIGHT LED illuminates.

If bumper turret control RIGHT LED does not illuminate, replace bumper turret control (WP 0376).

Step 72. While operating bumper turret control joystick to left (driver side) position (WP 0004), check if bumper turret control LEFT LED illuminates.

If bumper turret control LEFT LED does not illuminate, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

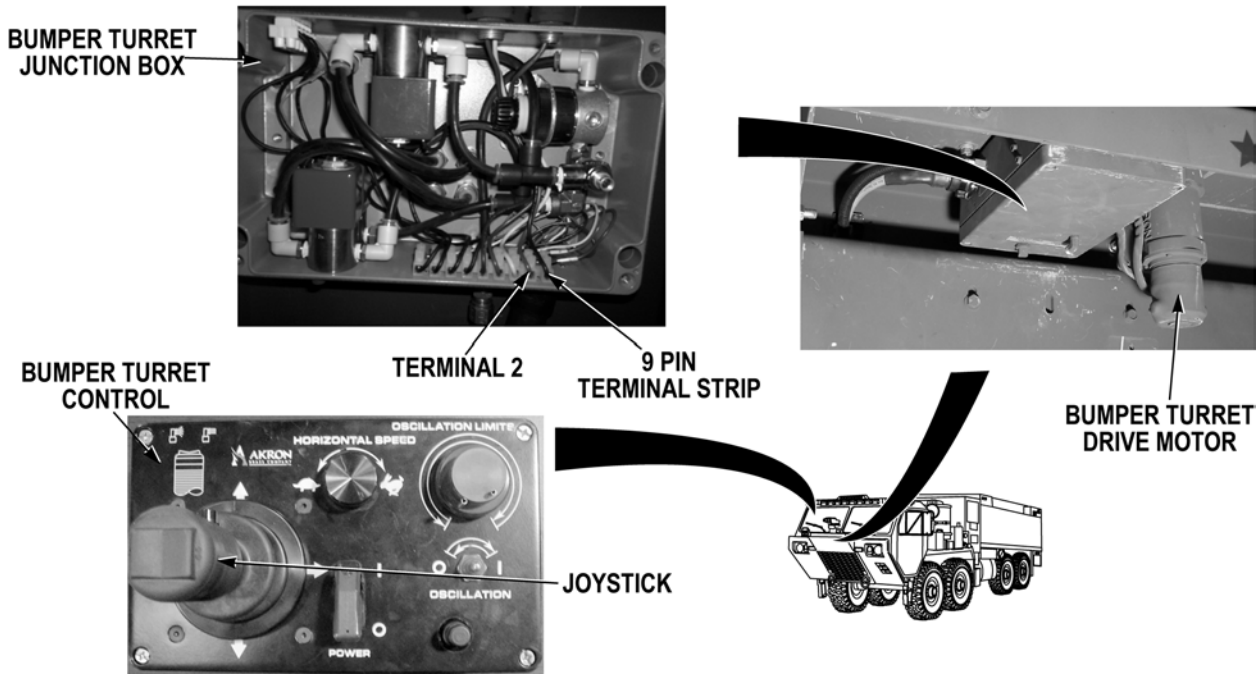
Step 73. Install bumper turret control cover and tighten four screws. Remove bumper turret junction box cover (WP 0378). Check for 22 to 28 VDC between bumper turret motor power wire (black) at bumper turret junction box 9 pin terminal strip, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, go to Step 79.

Step 74. While an assistant operates bumper turret control joystick to left (driver side) position (WP 0004), check if voltage drops to 6 VDC between bumper turret motor power wire (black) at bumper turret junction box 9 pin terminal strip, terminal 1 and a known good ground.

If voltage does not drop to 6 VDC, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 75. Check for 22 to 28 VDC between bumper turret motor power wire (red) at bumper turret junction box 9 pin terminal strip, terminal 2 and a known good ground.

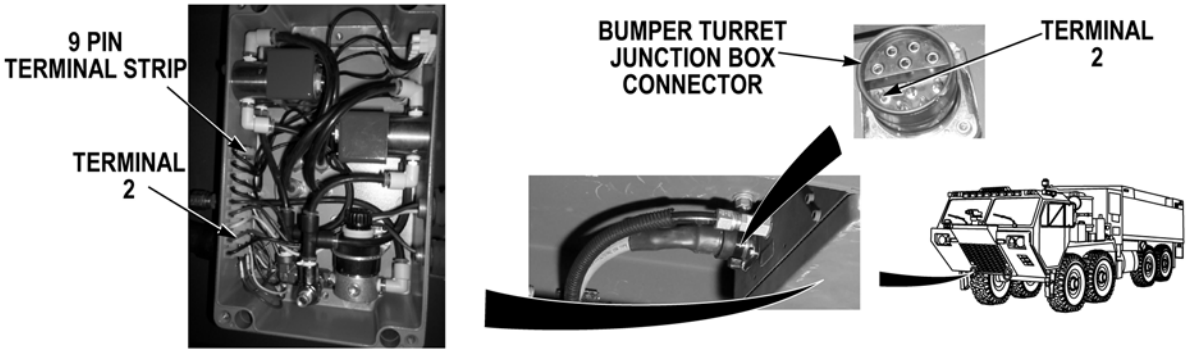
If 22 to 28 VDC are not present, go to Step 77.

Step 76. While an assistant operates bumper turret control joystick to right (passenger side) position (WP 0004), check if voltage drops to 6 VDC between bumper turret motor power wire (red) at bumper turret junction box 9 pin terminal strip, terminal 2 and a known good ground.

a. If voltage drops to 6 VDC, replace bumper turret motor (WP 0380).

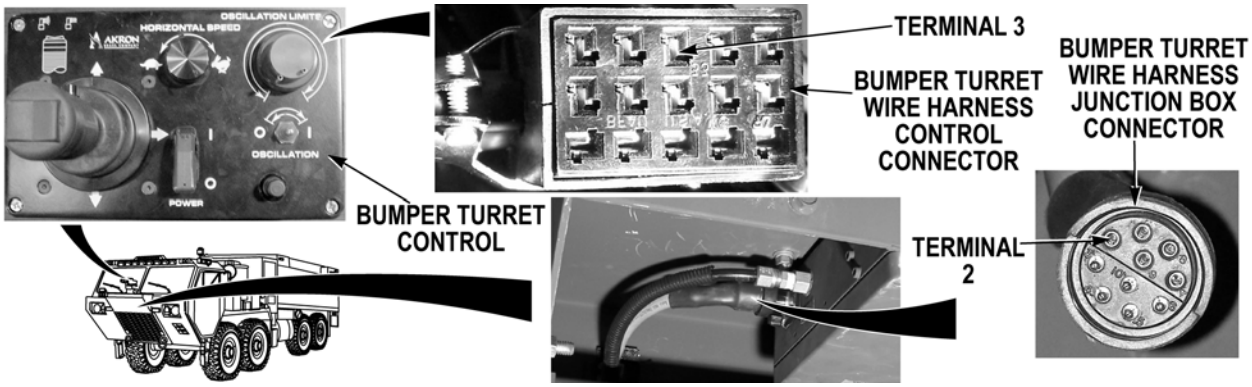
b. If voltage does not drop to 6 VDC, replace bumper turret control (WP 0376).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 77. Put bumper turret control POWER switch to ○ (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box motor power wire (red) from bumper turret junction box connector, terminal 2 to bumper turret junction box 9 pin terminal strip, terminal 2.

If there is no continuity, repair bumper turret junction box motor power wire (red) in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).

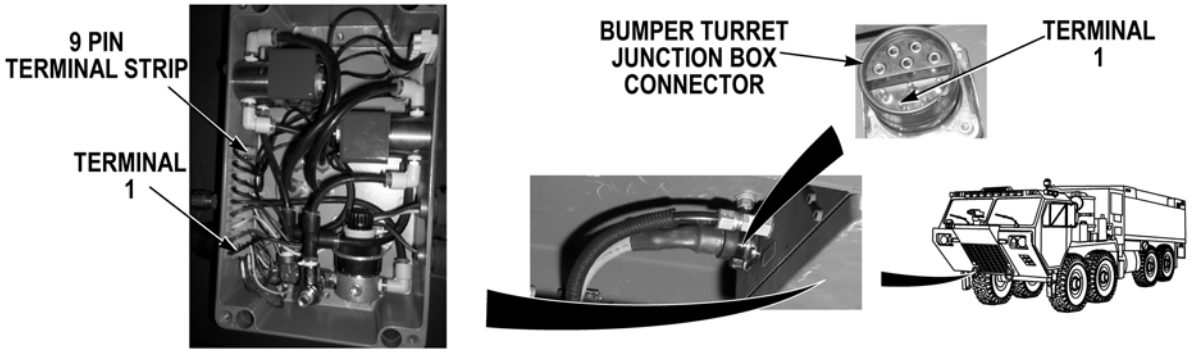


Step 78. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness motor power wire (red) from bumper turret wire harness bumper turret control connector, terminal 3 to bumper turret wire harness bumper turret junction box connector, terminal 2.

a. If there is continuity, replace bumper turret control (WP 0376).

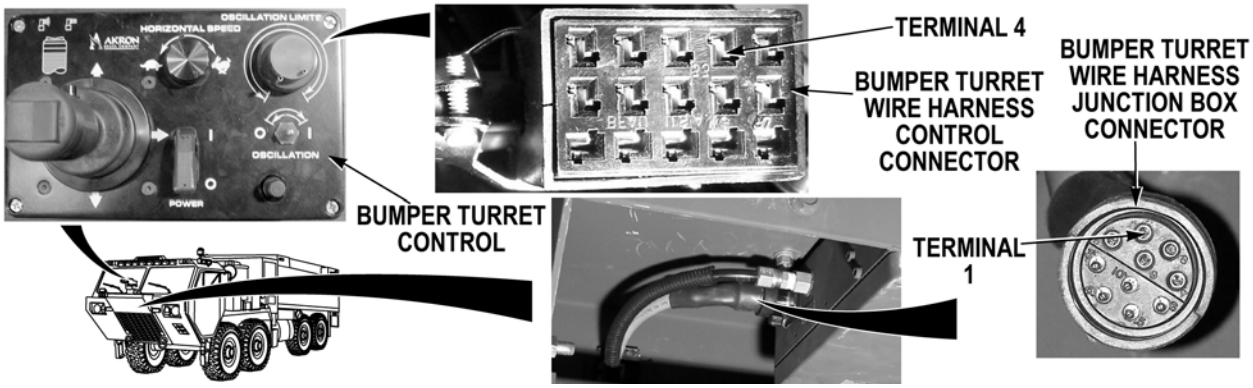
b. If there is no continuity, repair bumper turret wire harness motor power wire (red) in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 79. Put bumper turret control POWER switch to O (off) position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect bumper turret wire harness bumper turret junction box connector. Check for continuity across bumper turret junction box motor power wire (black) from bumper turret junction box connector, terminal 1 to bumper turret junction box 9 pin terminal strip, terminal 1.

If there is no continuity, repair bumper turret junction box motor power wire (black) in bumper turret junction box wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret junction box wire harness (WP 0378).



Step 80. Remove cab instrument panel E (WP 0203). Disconnect bumper turret wire harness bumper turret control connector. With a test lead set, check for continuity across bumper turret wire harness motor power wire (black) from bumper turret wire harness bumper turret control connector, terminal 4 to bumper turret wire harness bumper turret junction box connector, terminal 1.

a. If there is continuity, replace bumper turret control (WP 0376).

b. If there is no continuity, repair bumper turret wire harness motor power wire (black) in bumper turret wire harness if repairable (TM 9-2320-315-14&P), or replace bumper turret wire harness (WP 0277).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

DIRECT TANK FILL VALVE DOES NOT OPERATE PROPERLY (AUTO OR MANUAL MODE)

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0019
WP 0047
WP 0079
WP 0205
WP 0210
WP 0219

References (continued)
WP 0261
WP 0262
WP 0263
WP 0284
WP 0293
WP 0300
WP 0303
WP 0304
WP 0306
WP 0313
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

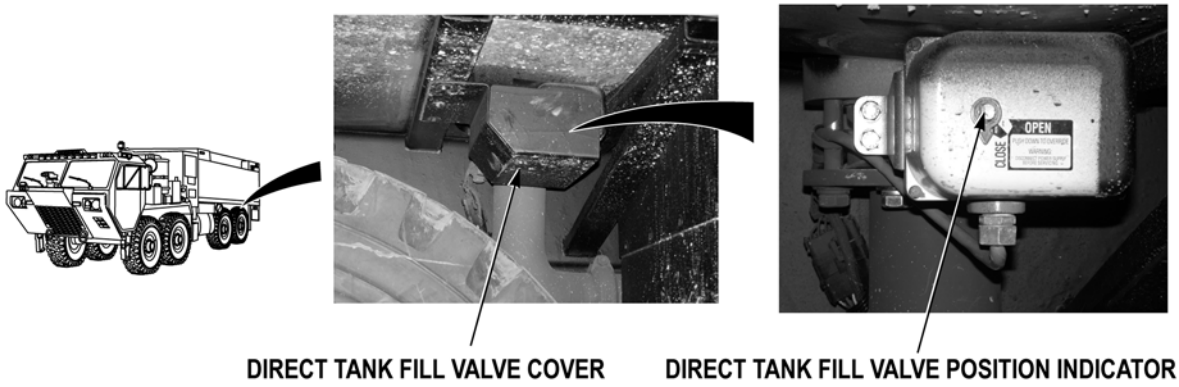
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DIRECT TANK FILL VALVE DOES NOT OPERATE PROPERLY (AUTO OR MANUAL MODE)

NOTE

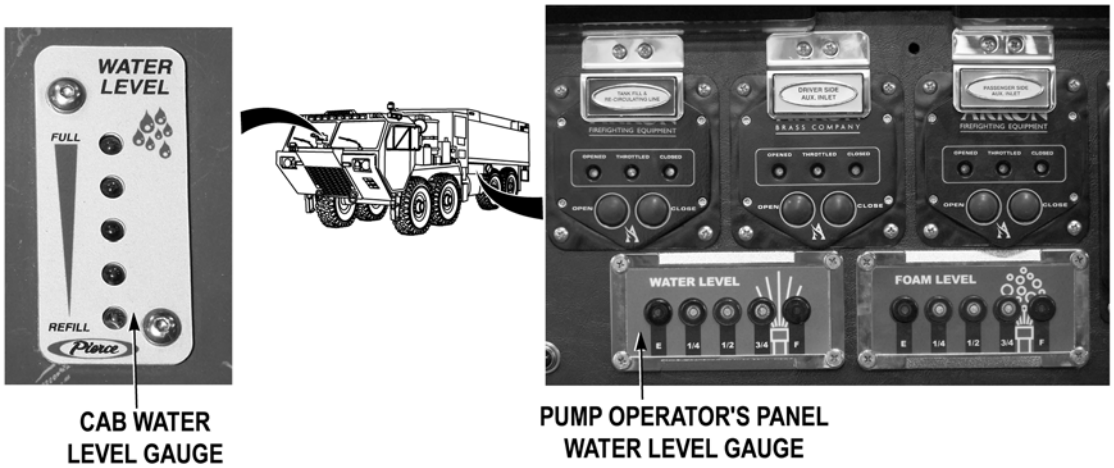
- Ensure cap is installed tightly on DIRECT TANK FILL during this procedure, or connect hose to DIRECT TANK FILL connector to drain water into appropriate container or to ground. If direct tank fill valve opens during this procedure, water will discharge from tank uncontrolled.
- Do not engage PUMP PTO during this procedure. Valve operation can be checked without pump operation.
- Valve operations can be checked by observing valve shaft rotation.
- If it is known that direct tank fill valve operates properly in manual mode, go to Step 2.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Remove direct tank fill valve cover (WP 0313). Push battery disconnect switch to on position (WP 0007). While an assistant puts pump operator's panel DIRECT TANK FILL switch to OPEN position (WP 0004) check if direct tank fill valve operates to open position.

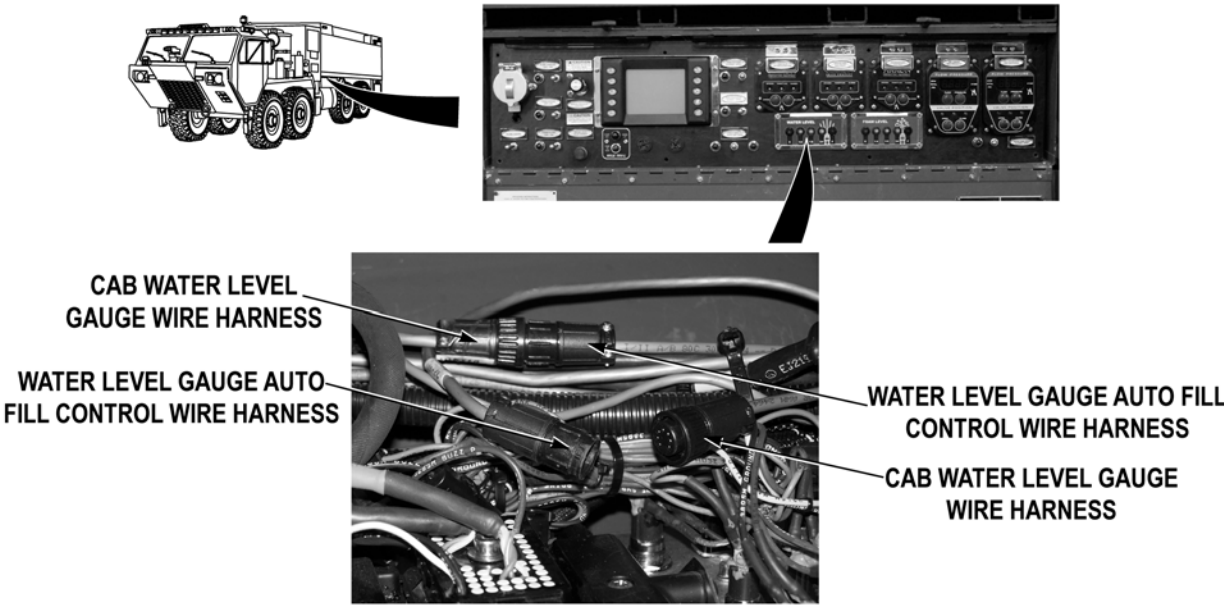
If direct tank fill valve does not operate to open position, go to Step 27.



Step 2. Put pump operator's panel DIRECT TANK FILL switch to OFF position (WP 0004). With water tank full, check if pump operator's panel and cab WATER LEVEL gauges indicate FULL (WP 0004).

If pump operator's panel and cab WATER LEVEL gauges are not operating properly, troubleshoot Water Tank Level Indicator Gauge Does Not Operate Properly (WP 0079)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



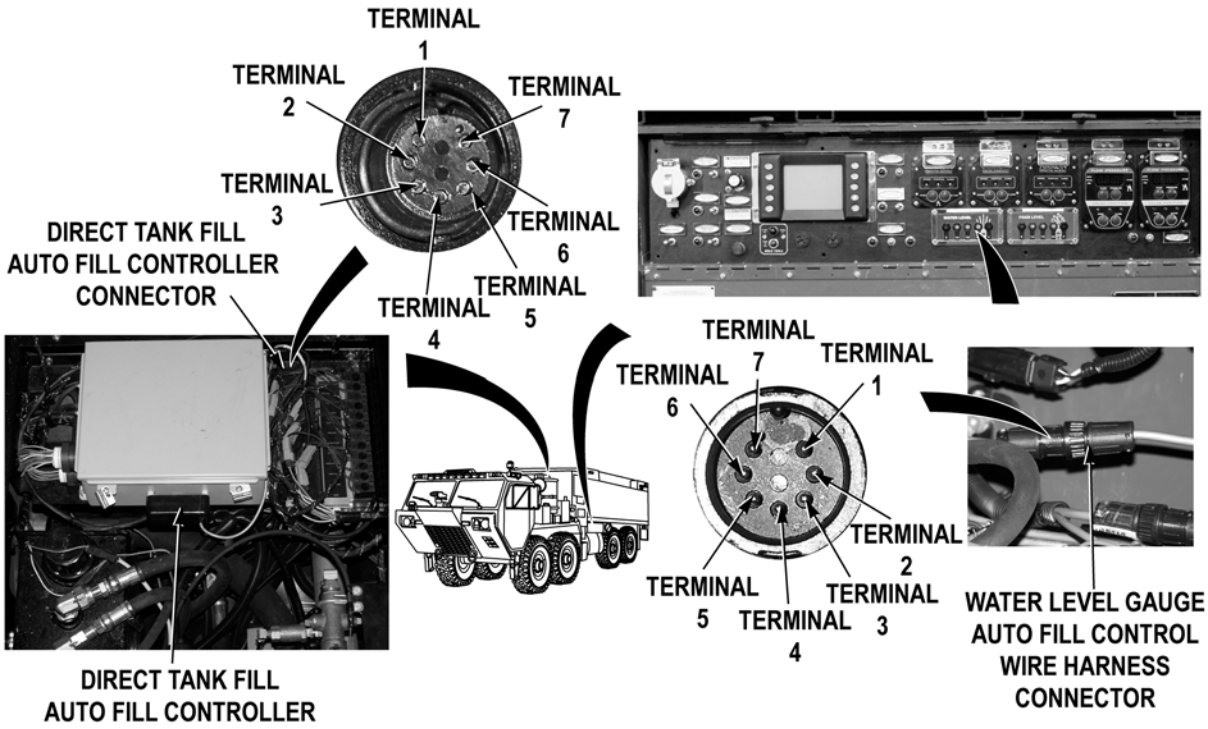
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Open pump operator's panel (WP 0205). Swap pump operator's panel WATER LEVEL gauge auto tank fill control and cab water level gauge wire harness connectors. Check if cab WATER LEVEL gauge indicates FULL (WP 0004).

If cab WATER LEVEL gauge does not indicate FULL, replace pump operator's panel WATER LEVEL gauge (WP 0210).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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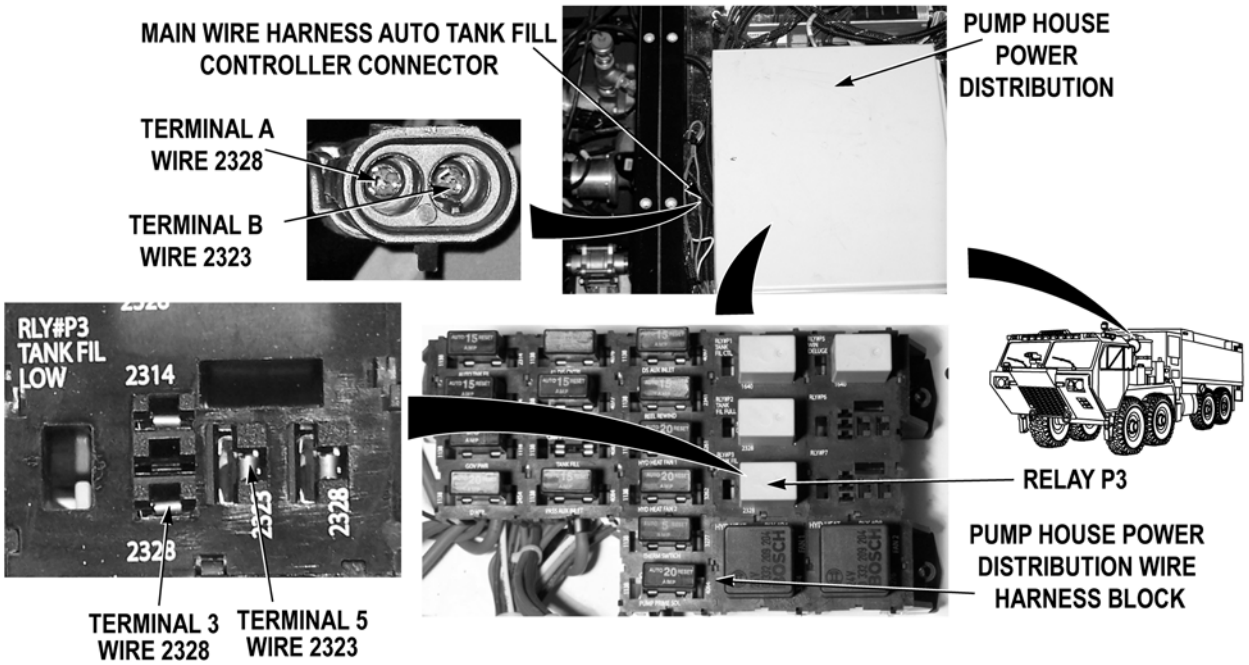
Step 4. Pull battery disconnect switch to off position (WP 0007). Reconnect pump operator's panel WATER LEVEL gauge cab water level gauge wire harness connector to original position. Remove pump house panel K (WP 0341). Disconnect auto tank fill control wire harness connector from direct tank fill auto fill controller. With a test lead set, check for continuity across auto tank fill control wire harness from pump operator's panel WATER LEVEL gauge connector, terminal 1 to auto tank fill controller connector, terminal 1. Note reading. Repeat continuity check for terminals 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, and 7 to 7.

If there is no continuity between any pair of terminals, replace auto tank fill wire harness (WP 0306).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Mark all relays before removing. Do not install relays except when instructed to do so in procedure.

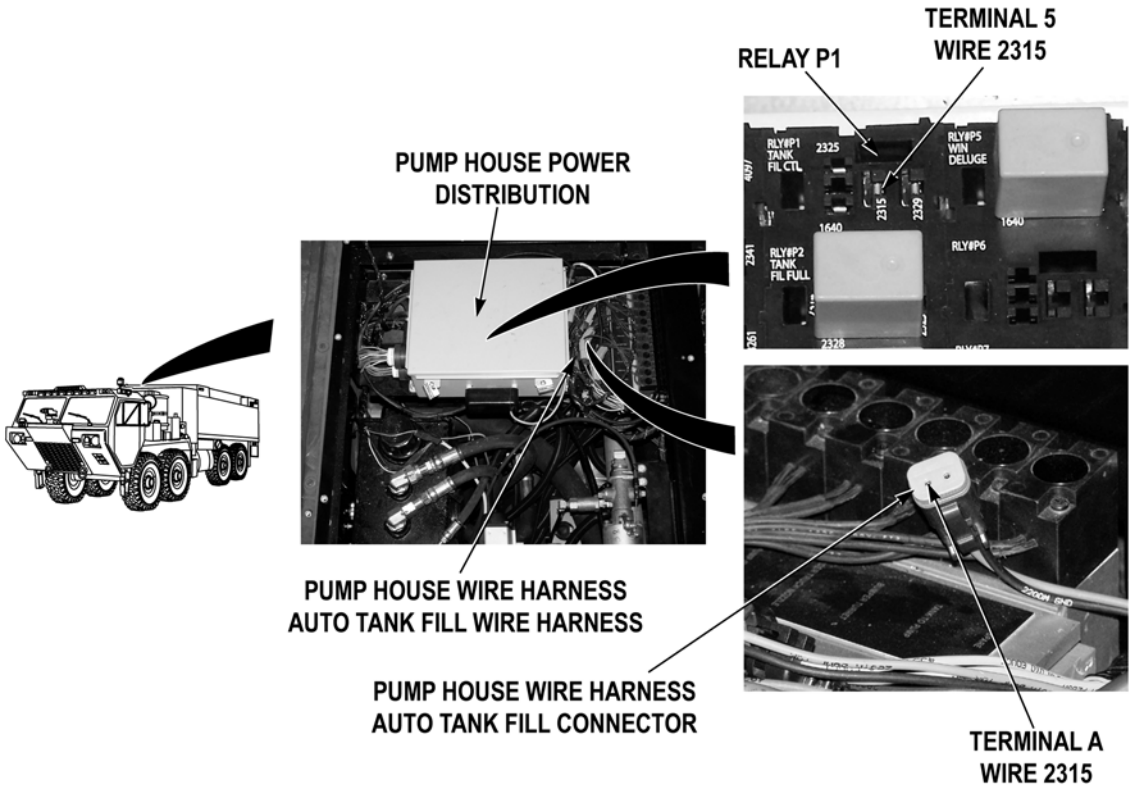
Step 5. Reconnect auto fill control wire harness to direct tank fill auto fill controller connector. Open pump house power distribution (WP 0262). Remove relay P3 (WP 0262). Disconnect main wire harness auto tank fill controller connector. With a test lead set, check for continuity across wire 2328 (green) from pump house power distribution wire harness relay P3 connector, terminal 3 to main wire harness auto tank fill controller connector, terminal A.

If there is no continuity, go to Step 26.

Step 6. With a test lead set, check for continuity across wire 2323 (brown) from pump house power distribution wire harness relay P3 connector, terminal 5 to main wire harness auto tank fill controller connector, terminal B.

If there is no continuity, go to Step 25.

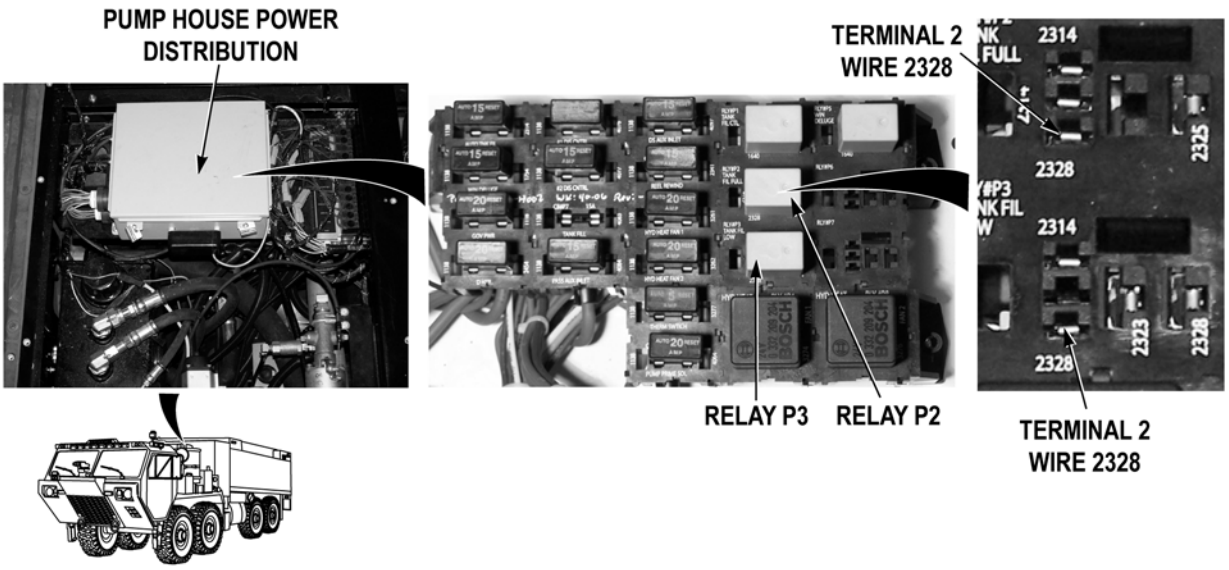
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Remove relay P1 (WP 0262). Disconnect pump house wire harness auto tank fill connector. With a test lead set, check for continuity across wire 2315 (yellow) from pump house power distribution wire harness relay P1 connector, terminal 5, to pump house wire harness auto tank fill connector, terminal A.

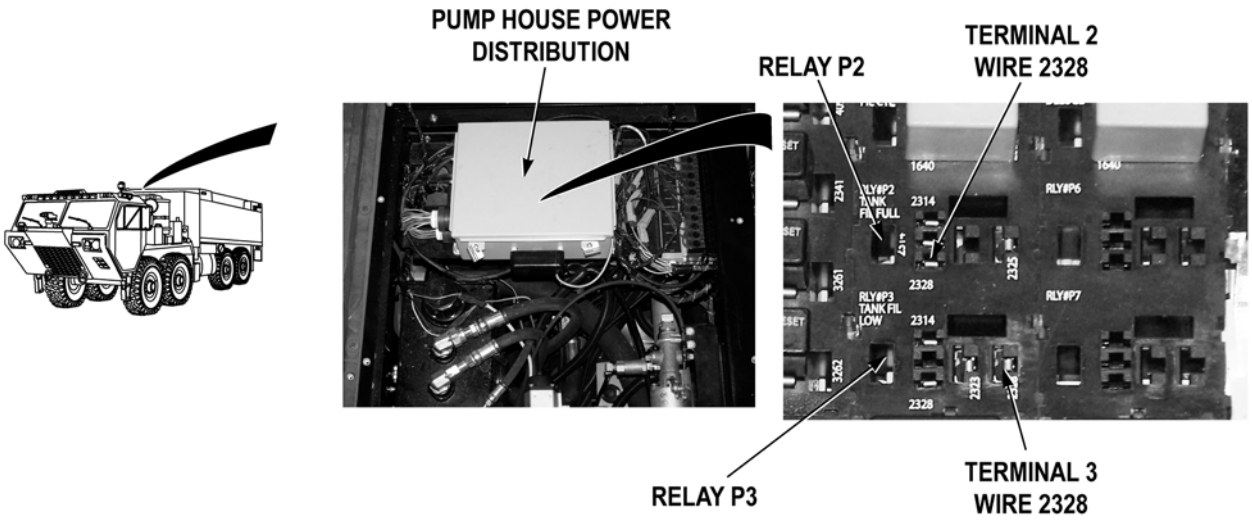
If there is no continuity, go to Step 23.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Remove relay P2 (WP 0262). With a test lead set, check for continuity across pump house power distribution wire harness wire 2328 (green) from relay P2 connector, terminal 2 to relay P3 connector, terminal 2.

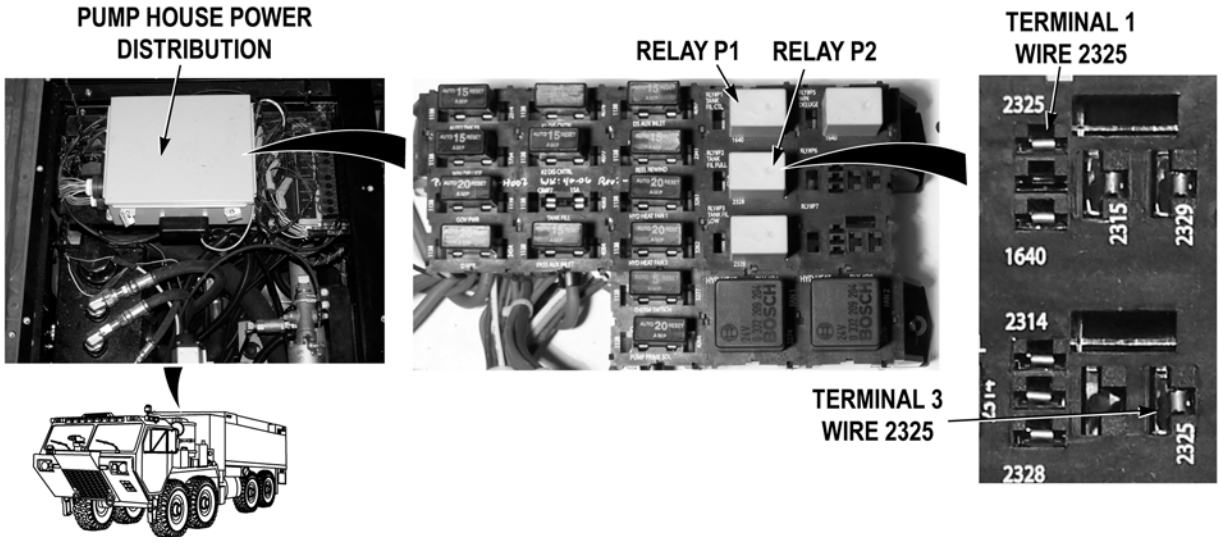
If there is no continuity, replace pump house power distribution wire harness and block (WP 0300).



Step 9. With a test lead set, check for continuity across pump house power distribution wire harness wire 2328 (green) from relay P2 connector, terminal 2 to relay P3 connector, terminal 3.

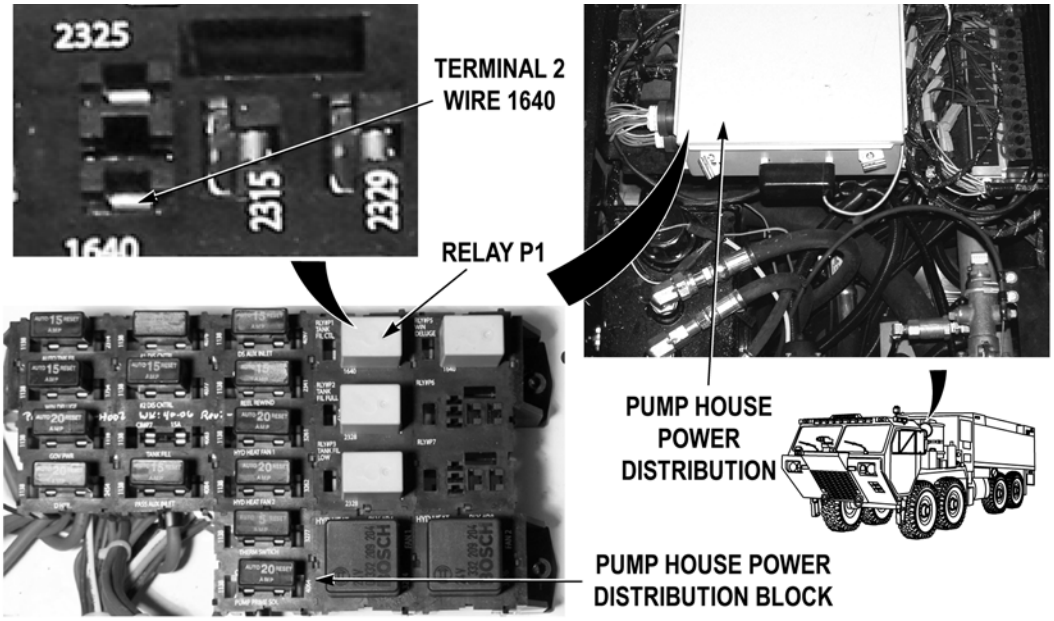
If there is no continuity, replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. With a test lead set, check for continuity across pump house power distribution wire harness wire 2325 (black) from relay P2 connector, terminal 3 to relay P1 connector, terminal 1.

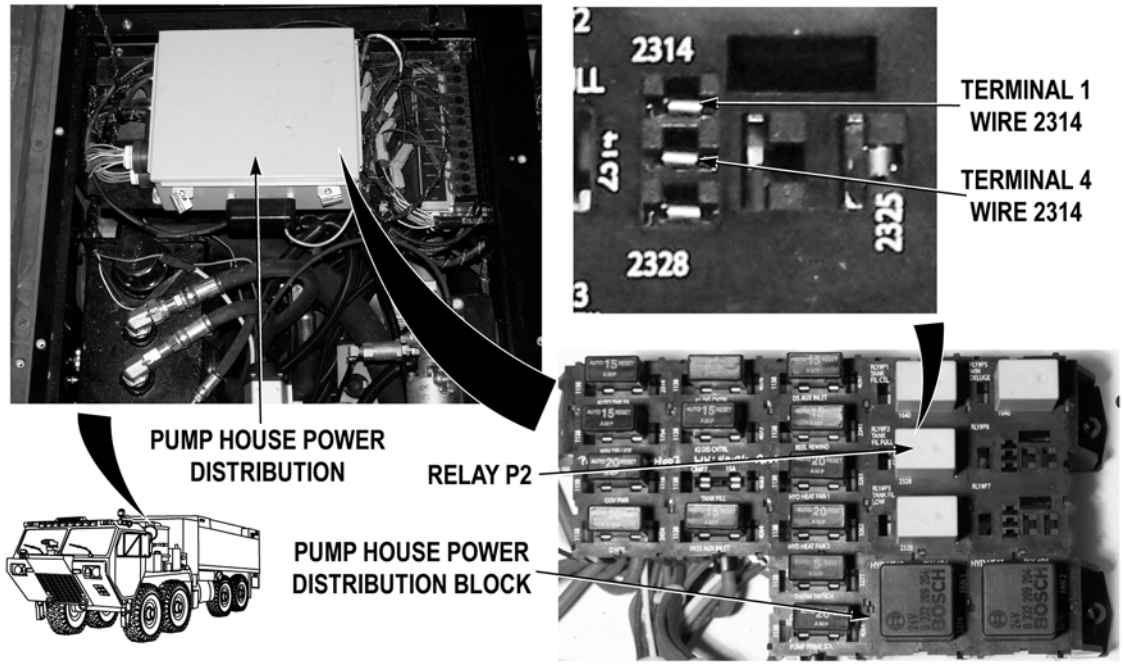
If there is no continuity, replace pump house power distribution wire harness and block (WP 0300).



Step 11. With a test lead set, check for continuity across pump house power distribution wire harness wire 1640 (black) from relay P1 connector, terminal 2 to a known good ground.

If there is no continuity, replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



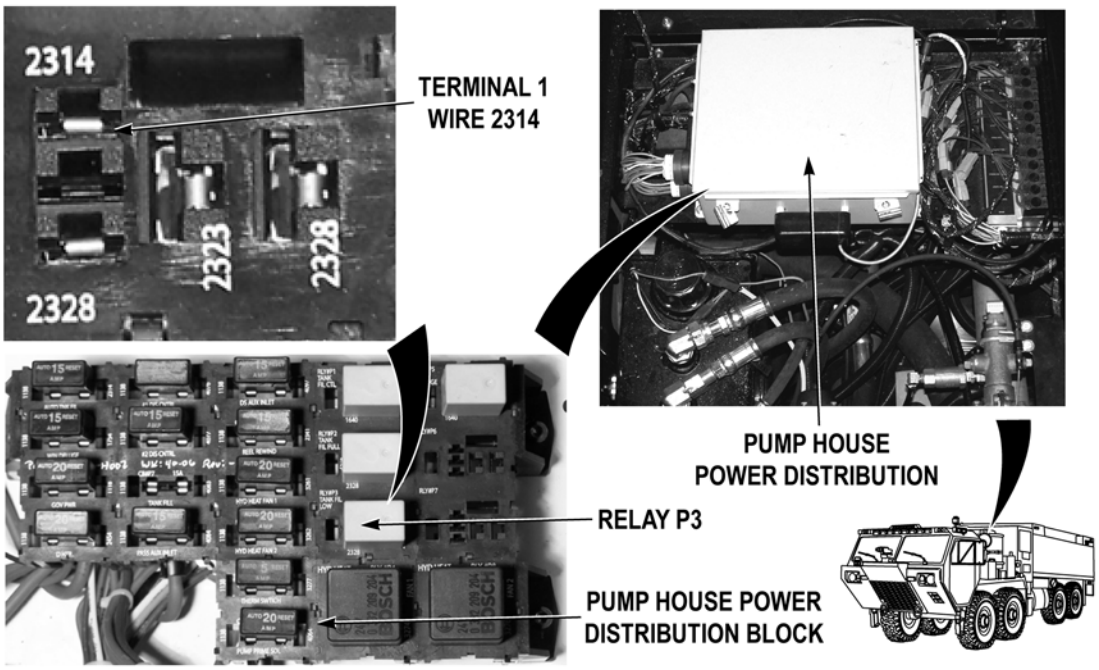
Step 12. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 2314 (red) at relay P2 connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, replace pump house power distribution wire harness and block (WP 0300).

Step 13. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 2314 (red) at relay P2 connector, terminal 4 and a known good ground.

If 22 to 28 VDC are not present, replace pump house power distribution wire harness and block (WP 0300).

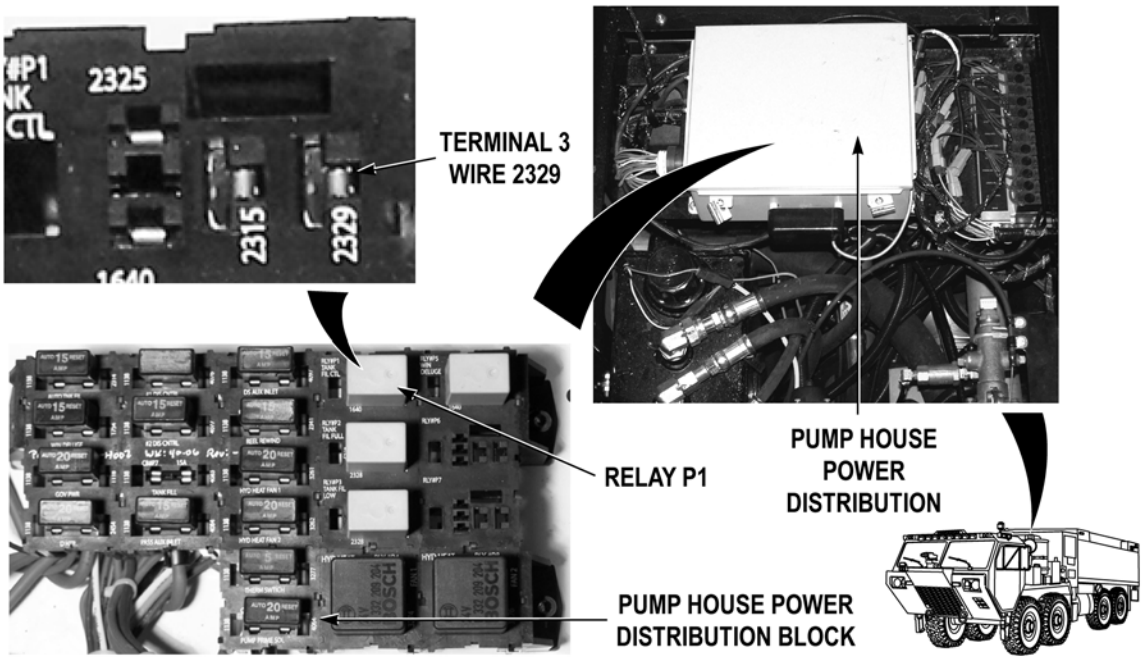
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 2314 (red) at relay P3 connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, replace pump house power distribution wire harness and block (WP 0300).

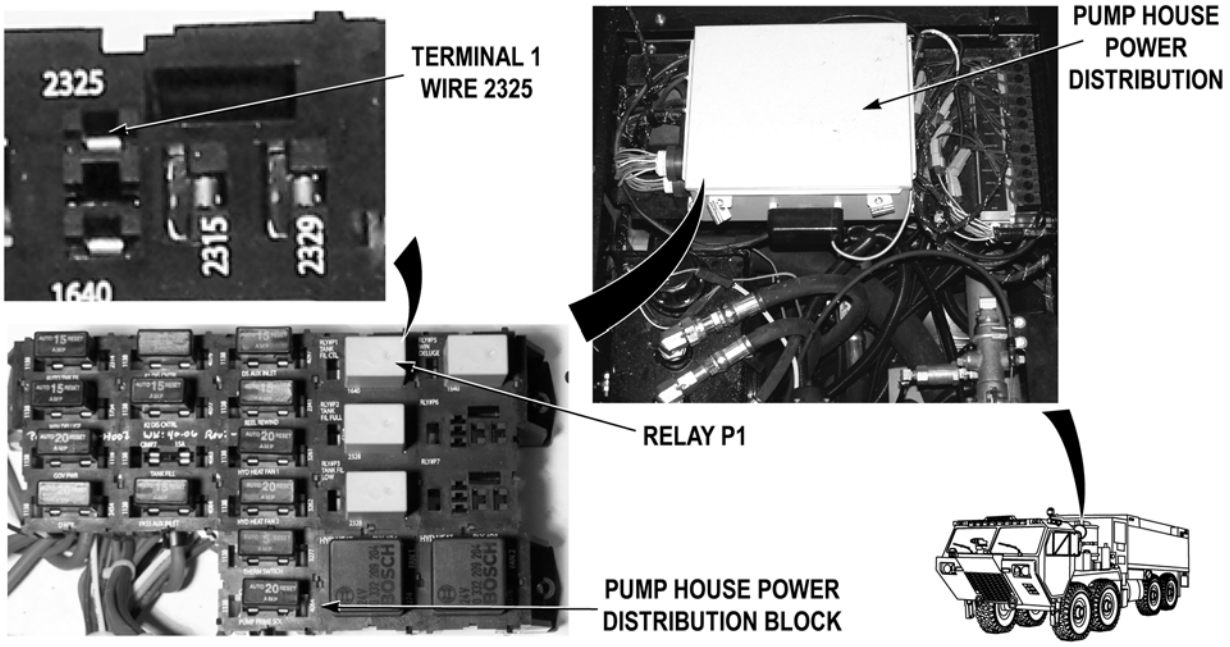
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Put pump operator's panel DIRECT TANK FILL switch to AUTO position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 2329 (blue) at relay P1 connector, terminal 3 and a known good ground.

If 22 to 28 VDC are not present, go to Step 20.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

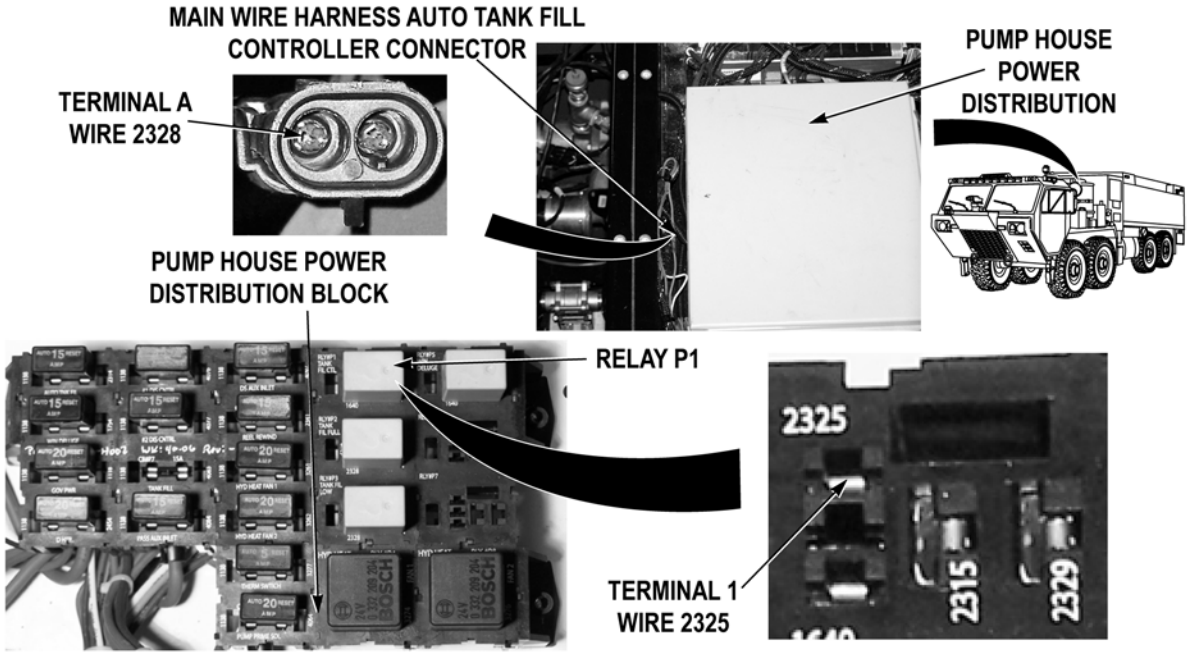
NOTE

Steps 16 through 19 will isolate fault to a faulty relay. Perform steps as written, replacing relays when instructed, to ensure faulty relay is located.

Step 16. Install relay P2 (WP 0262). With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 2325 (black) at relay P1 connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, install relay P1 and replace relay P2 (WP 0262).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Install test lead set between main wire harness wire 2328 (green) at auto tank fill controller connector, terminal A and a known good ground. Check for 0 VDC between pump house power distribution wire harness wire 2325 at relay P1 connector, terminal 1 and a known good ground.

If 22 to 28 VDC are present, install relays in original positions and replace relay P2 (WP 0262).

Step 18. Remove relay P2 (WP 0262). Install relay P3 in relay P2 connector location (WP 0262). With a test lead set installed between main wire harness wire 2328 (green) at auto fill controller connector, terminal A and a known good ground. Check for 0 VDC between pump house power distribution wire harness wire 2325 (black) at relay P1 connector, terminal 1 and a known good ground.

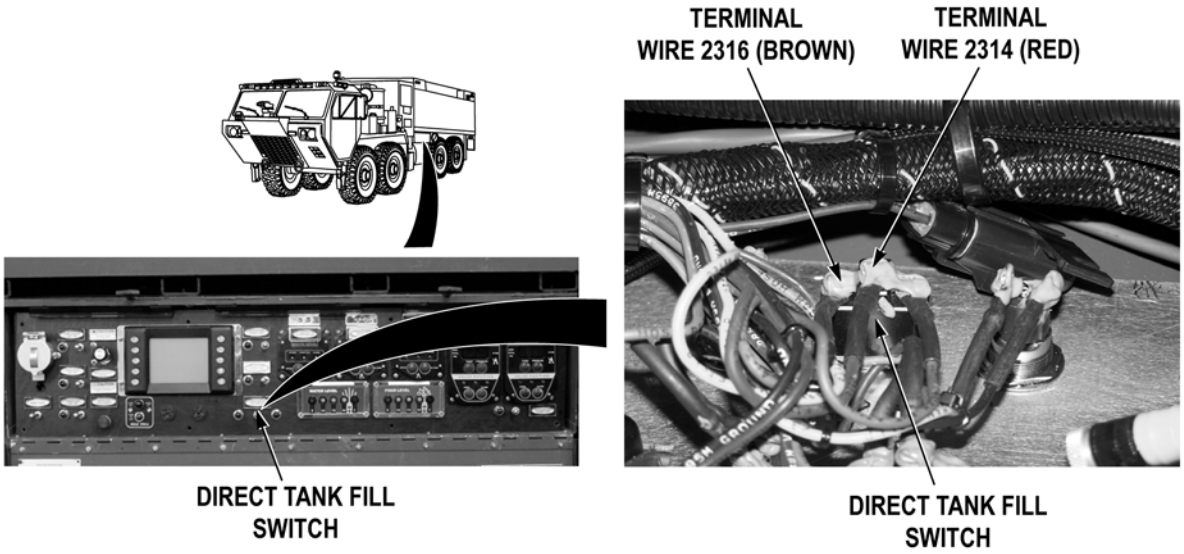
If 22 to 28 VDC are present, install relays in original positions and replace relay P3 (WP 0262).

Step 19. Remove relay P3 from relay P2 connector (WP 0262). Install relay P1 in relay P2 connector location (WP 0262) With a test lead set installed between main wire harness wire 2328 (green) at auto tank fill controller connector, terminal A and a known good ground. Check for 0 VDC between pump house power distribution wire harness wire 2325 (black) at relay P1 connector, terminal 1 and a known good ground

a. If 22 to 28 VDC are present, install relays in original positions and replace relay P1 (WP 0262).

b. If direct tank fill auto tank fill function does not operate properly, replace auto tank fill controller (WP 0263).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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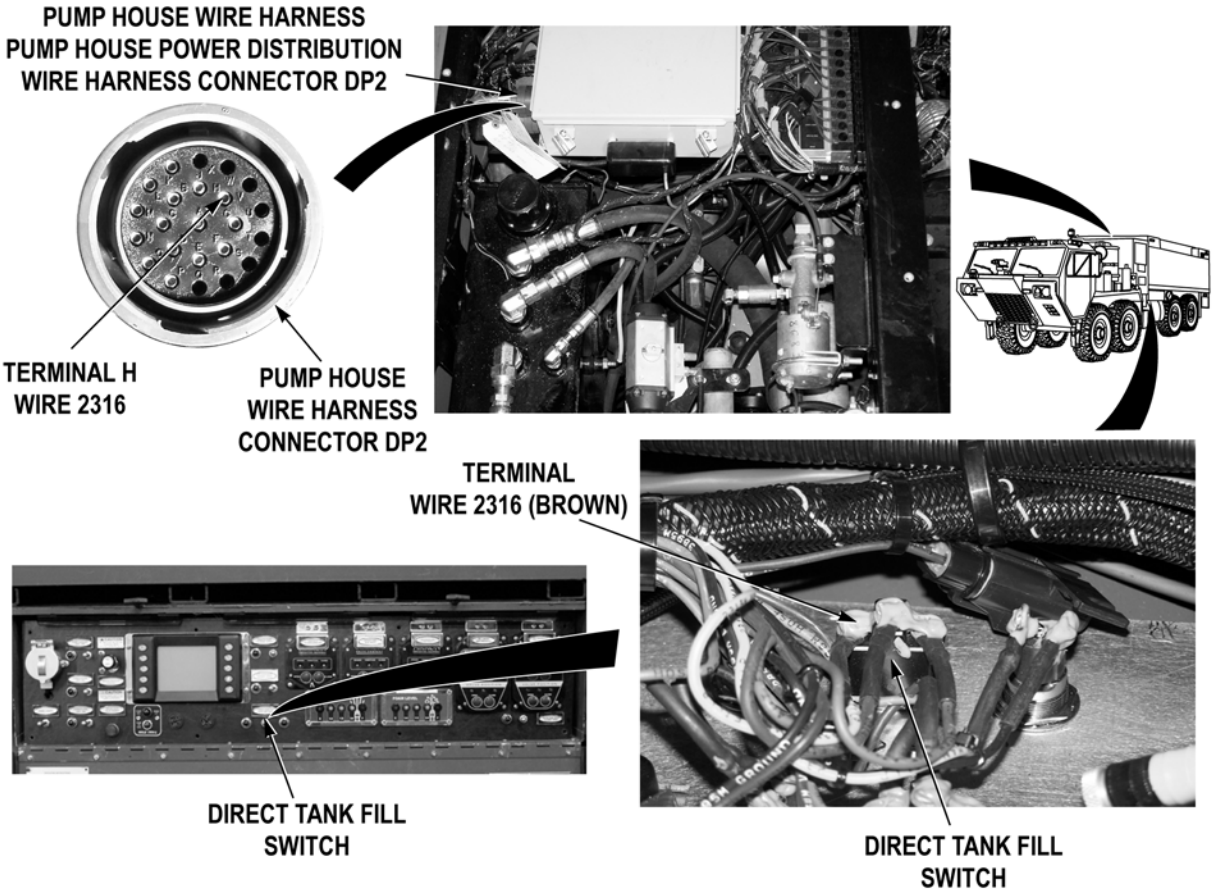
Step 20. Pull battery disconnect switch to off position (WP 0007). Connect main wire harness auto tank fill controller connector. Check for continuity across pump operator's panel DIRECT TANK FILL switch, from terminal wire 2314 (red) to terminal wire 2316 (brown), when switch is in AUTO position.

If there is no continuity, replace DIRECT TANK FILL switch (WP 0219).

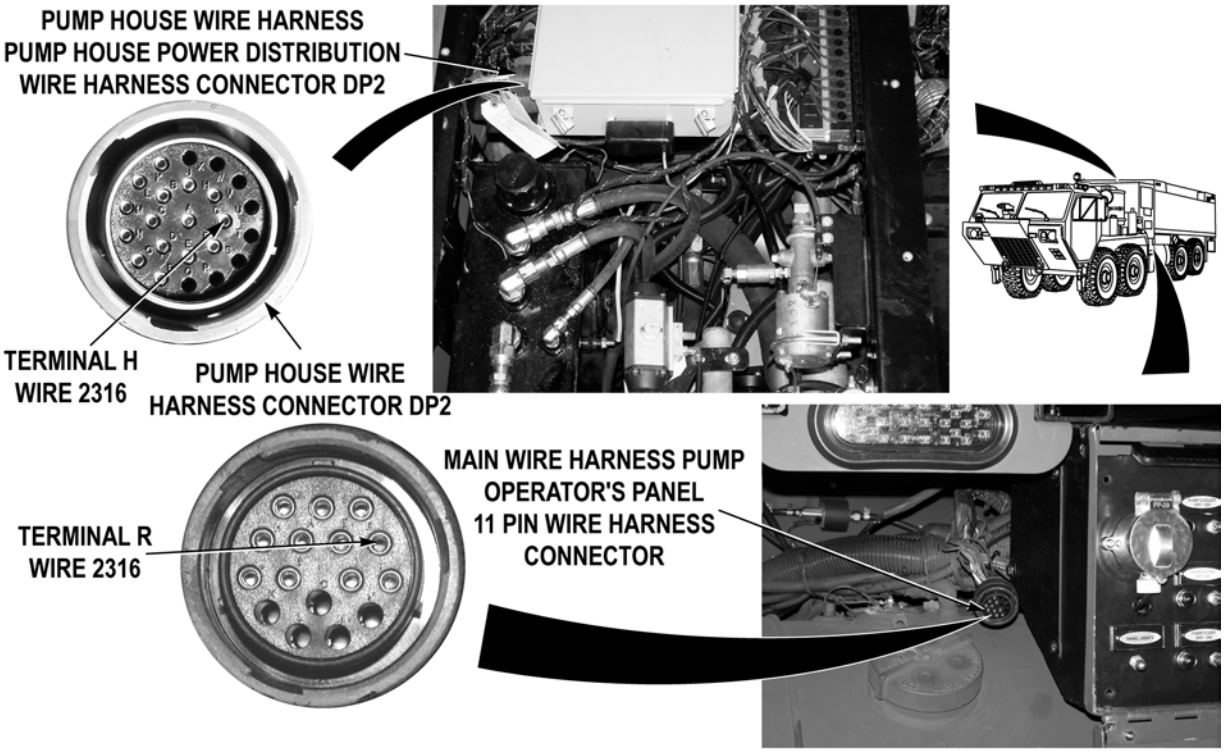
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 21. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across wire 2316 (brown) from pump operator's panel DIRECT TANK FILL switch, terminal wire 2316 to pump house wire harness pump house power distribution wire harness connector DP2, terminal H.

If there is continuity, repair wire 2316 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

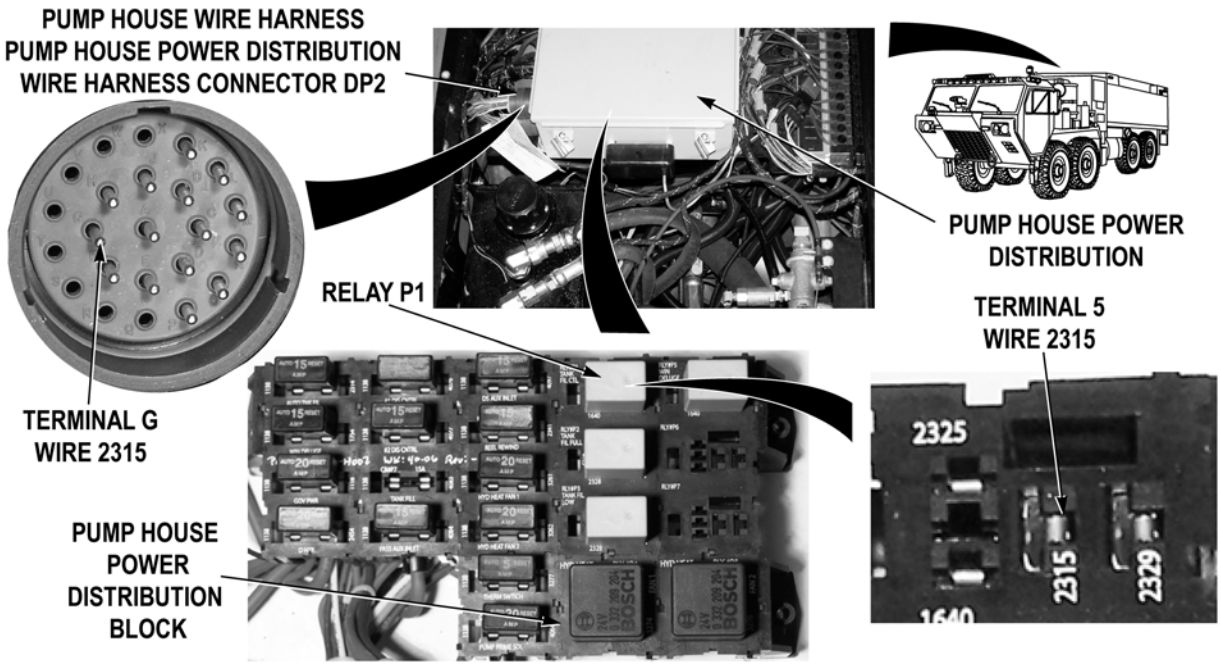


Step 22. Disconnect main wire harness pump operator's panel 11 pin wire harness connector. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across wire 2316 (brown) from main wire harness pump operator's panel 11 pin wire harness connector, terminal R to pump house wire harness pump house power distribution wire harness connector DP2, terminal H.

a. If there is continuity, repair wire 2316 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 2316 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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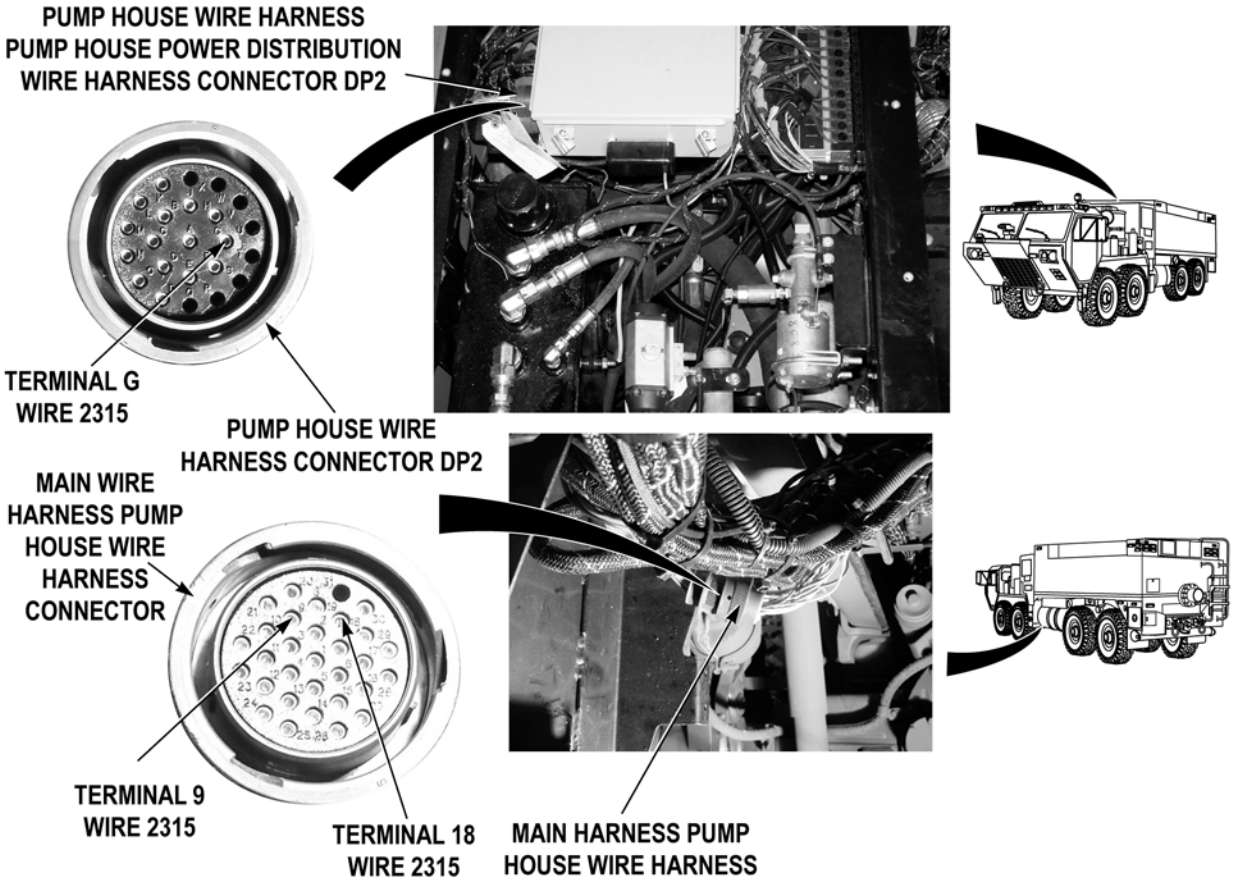
Step 23. Connect main wire harness auto tank fill controller connector. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across pump house power distribution wire harness wire 2315 (yellow) from relay P1 connector, terminal 5 to pump house power distribution wire harness connector DP2, terminal G.

If there is no continuity, repair wire 2315 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

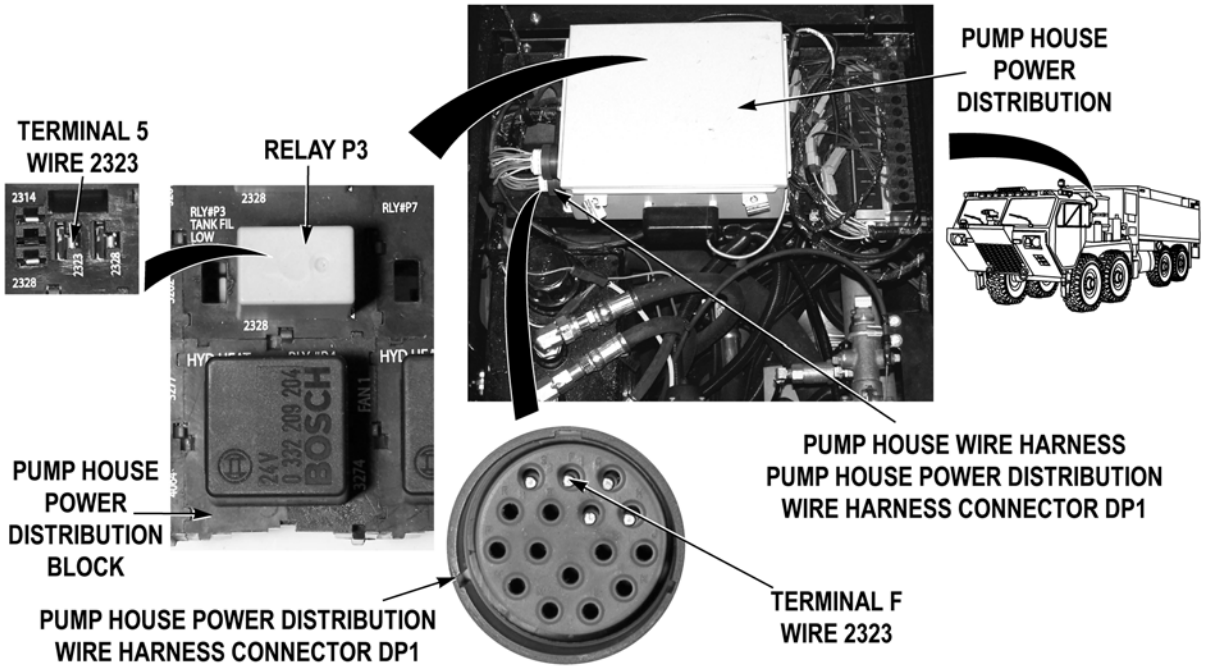


Step 24. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 2315 (yellow) from pump house wire harness pump house power distribution wire harness connector DP2, terminal G, to main wire harness pump house wire harness connector, terminal 9 and 18.

a. If there is continuity, repair wire 2315 in main wire harness if repairable, (TM 9-2320-315-14&P) or replace main wire harness (WP 0293).

b. If there is no continuity at either terminal, repair wire 2315 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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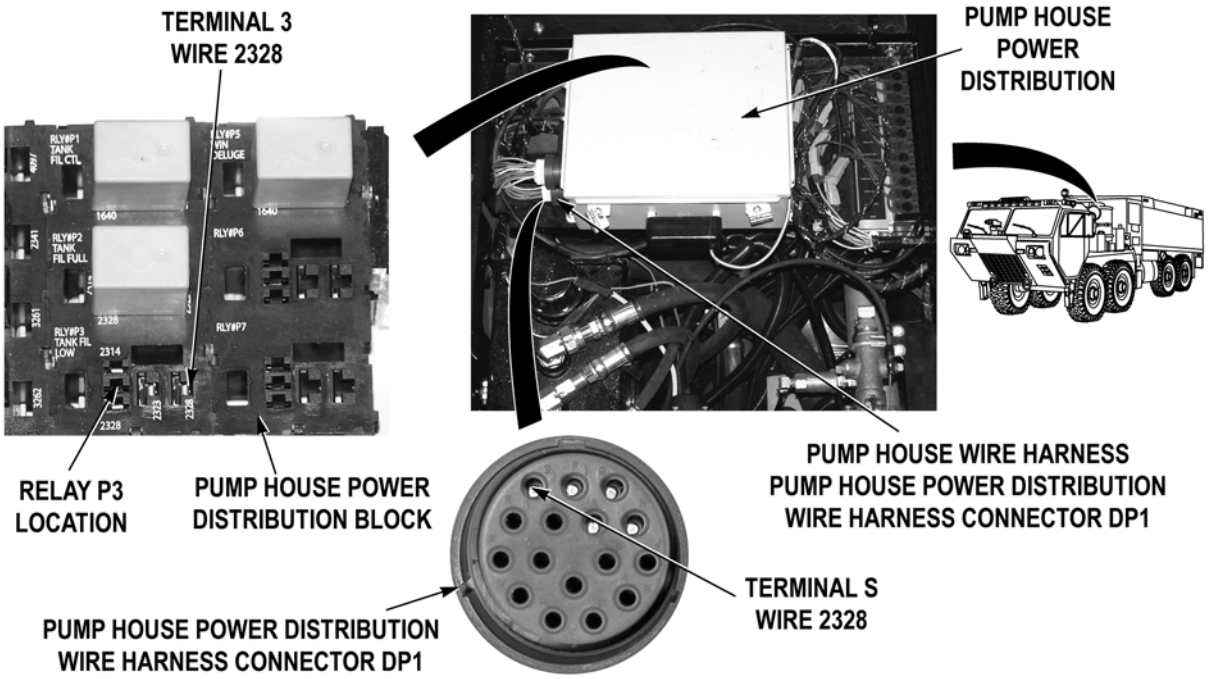
Step 25. Disconnect pump house wire harness pump house power distribution wire harness connector DP1. With a test lead set, check for continuity across pump house power distribution wire harness wire 2323 (brown) from relay P3 connector, terminal 5, to pump house power distribution wire harness connector DP1, terminal F.

a. If there is continuity, repair wire 2323 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0304).

b. If there is no continuity, repair wire 2323 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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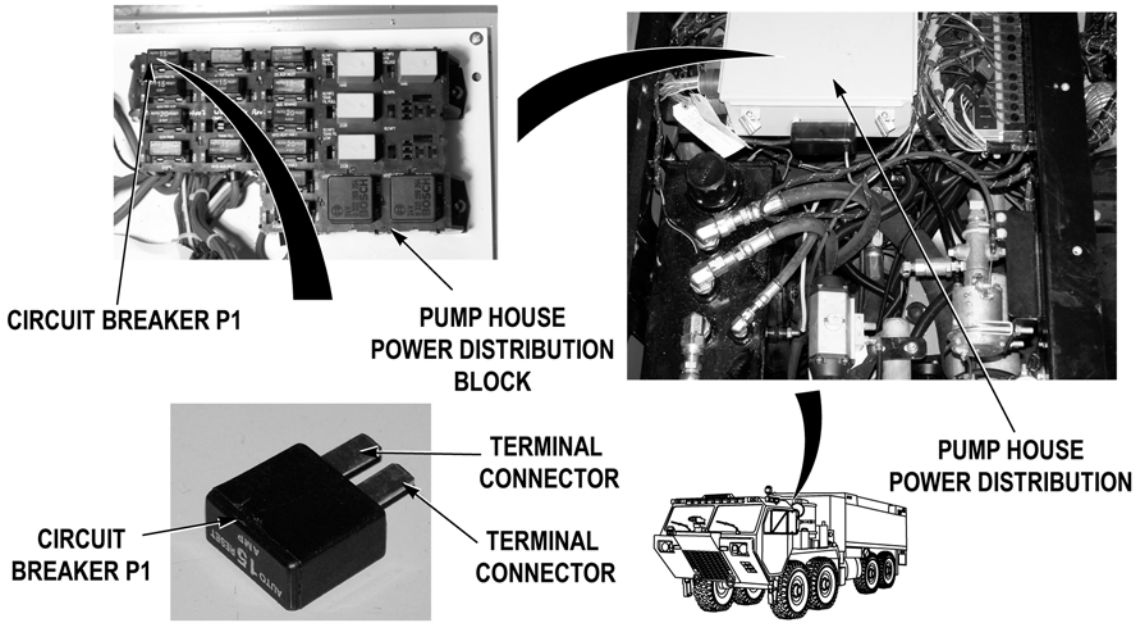
Step 26. Disconnect pump house wire harness pump house power distribution wire harness connector DP1. With a test lead set, check for continuity across pump house power distribution wire harness wire 2328 (green) from relay P3 connector, terminal 3 to pump house power distribution wire harness connector DP1, terminal S.

a. If there is continuity, repair wire 2328 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0304).

b. If there is no continuity, repair wire 2328 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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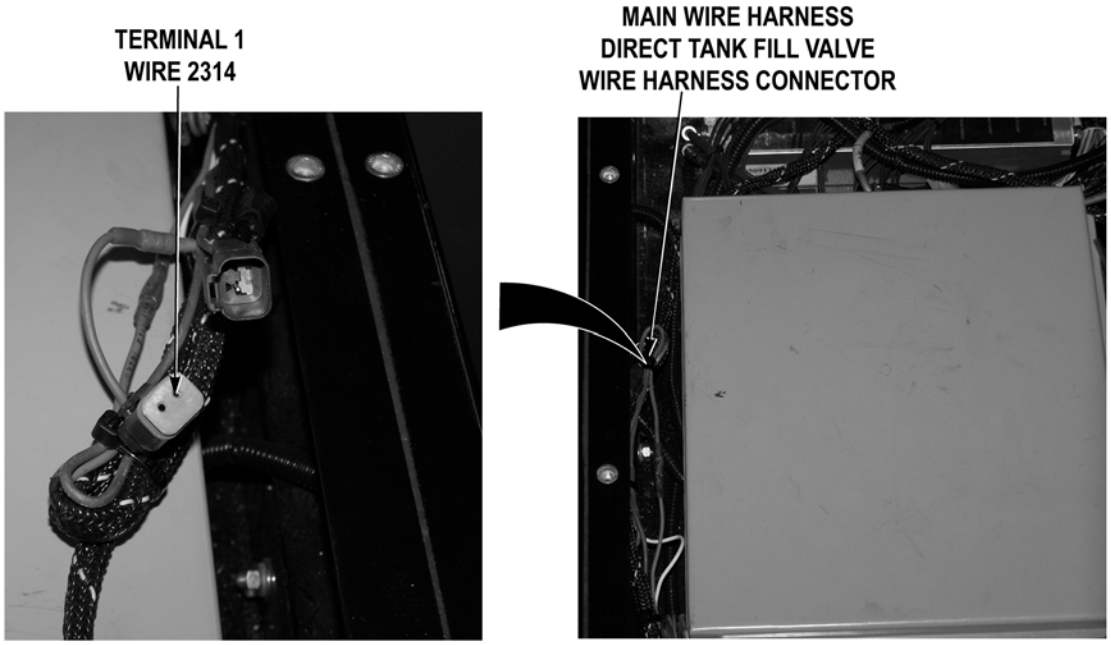
Step 27. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P1 (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P1 (WP 0261).

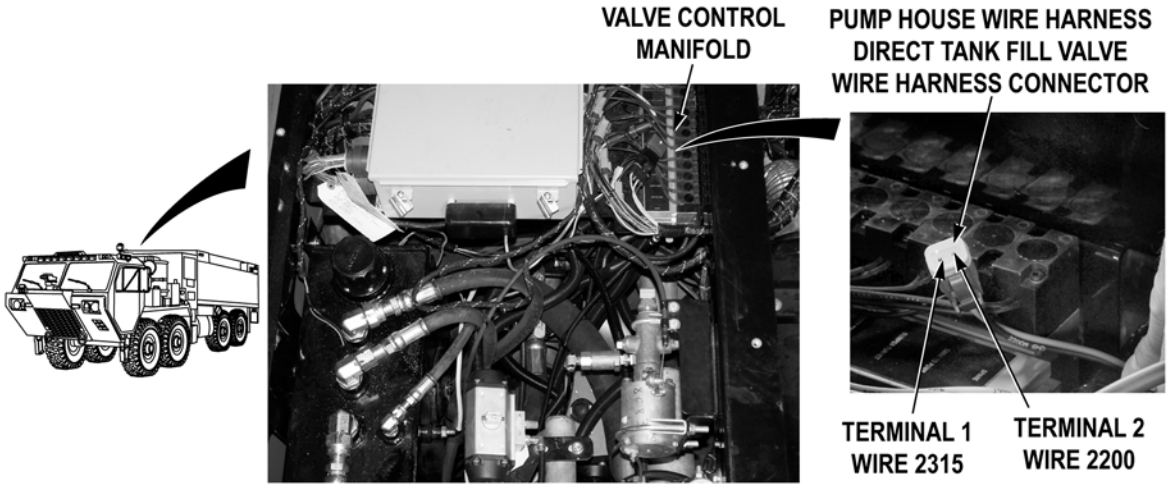
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 28. Install circuit breaker P1 (WP 0261). Disconnect main wire harness direct tank fill valve connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between main wire harness wire 2314 (red) at direct tank fill valve wire harness connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, go to Step 37.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



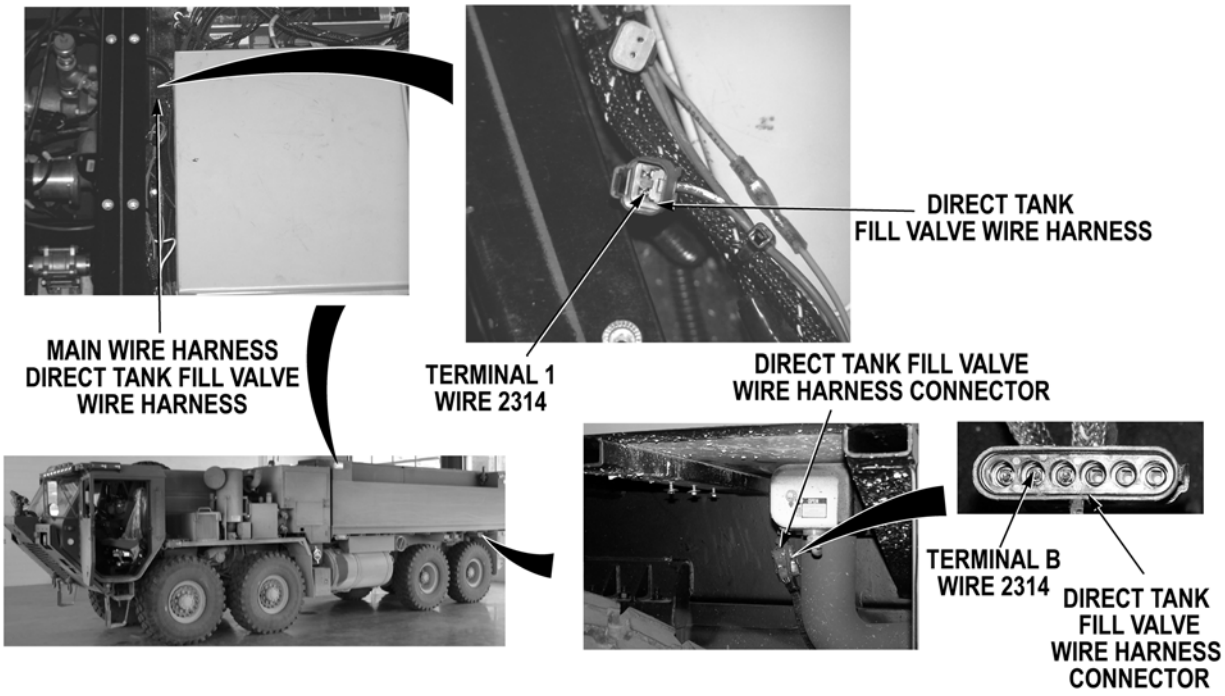
Step 29. Disconnect pump house wire harness direct tank fill valve connector. Put pump operator's panel DIRECT TANK FILL switch to OPEN position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2315 (yellow) at pump house wire harness direct tank fill wire harness connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, go to Step 35.

Step 30. Put DIRECT TANK FILL switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness direct tank fill valve connector, terminal 2 to a known good ground.

If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0304).

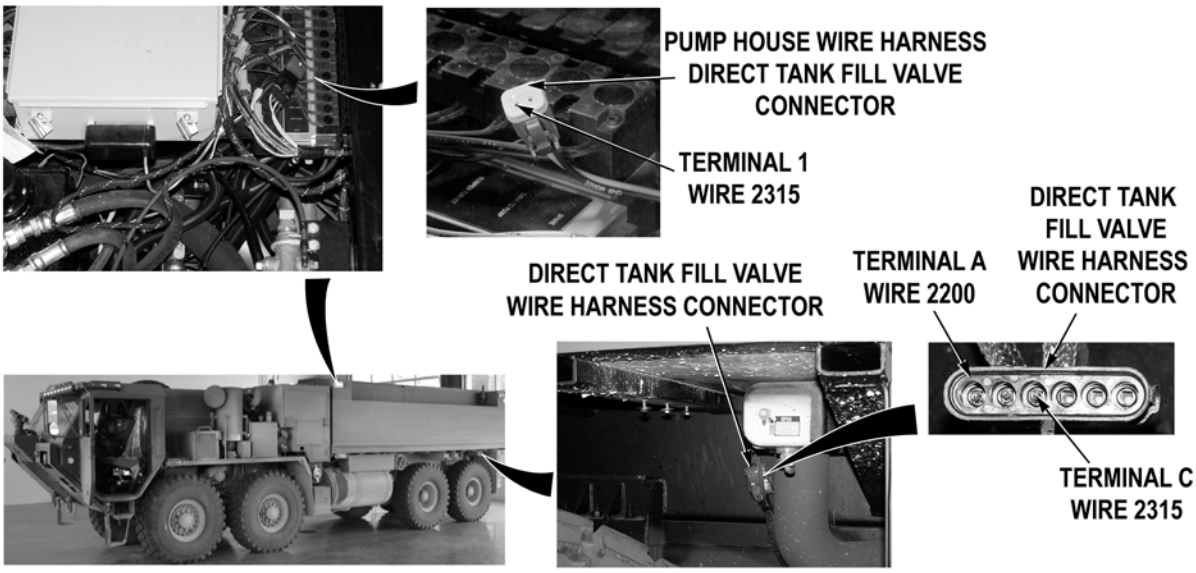
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 31. Disconnect direct tank fill valve wire harness direct tank fill valve connector. With a test lead set, check for continuity across direct tank fill valve wire harness wire 2314 (red) from main wire harness direct tank fill wire harness connector, terminal 1 to direct tank fill valve wire harness connector, terminal B.

If there is no continuity, repair wire 2314 in direct tank fill valve wire harness if repairable (TM 9-2320-315-14&P), or replace direct tank fill valve wire harness (WP 0284).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 32. With a test lead set, check for continuity across direct tank fill valve wire harness wire 2315 (yellow) from pump house wire harness direct tank fill valve connector, terminal 1 to direct tank fill valve wire harness connector, terminal C.

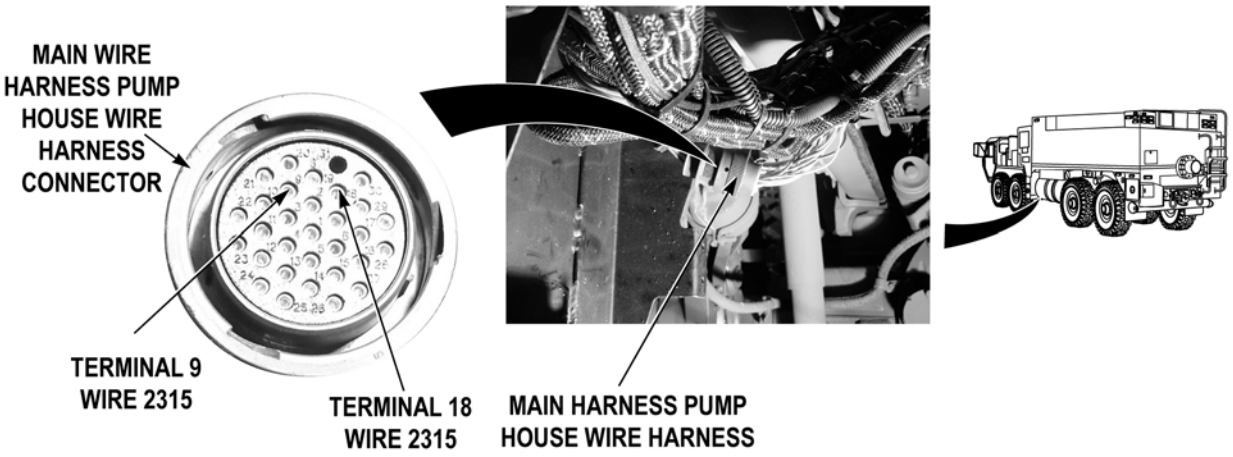
If there is no continuity, repair wire 2315 in direct tank fill valve wire harness if repairable (TM 9-2320-315-14&P), or replace direct tank fill valve wire harness (WP 0284).

Step 33. With a test lead set, check for continuity across direct tank fill valve wire harness wire 2200 (black) from direct tank fill valve wire harness connector, terminal A to a known good ground.

a. If there is continuity, replace direct tank fill valve actuator (WP 0047).

b. If there is no continuity, repair wire 2200 in direct tank fill valve wire harness if repairable (TM 9-2320-315-14&P), or replace direct tank fill valve wire harness (WP 0284).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



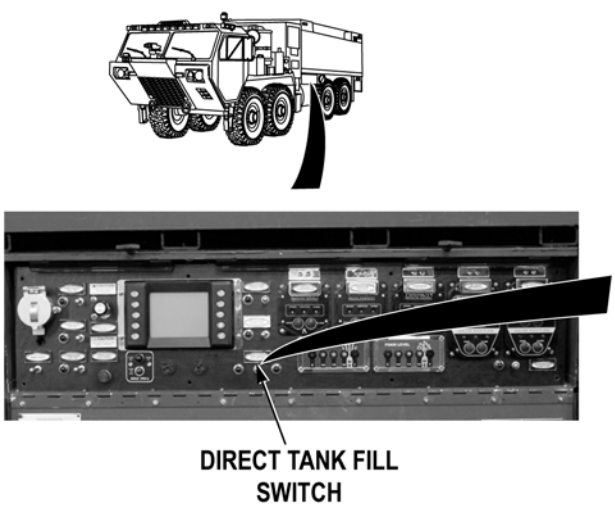
WARNING

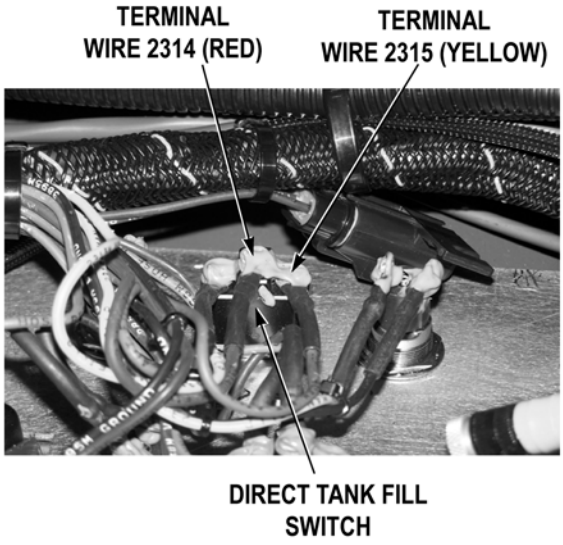
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 34. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2315 (yellow) at main wire harness pump house wire harness connector, terminal 9 and terminal 18 to a known good ground.

If 22 to 28 VDC are present, repair wire 2315 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





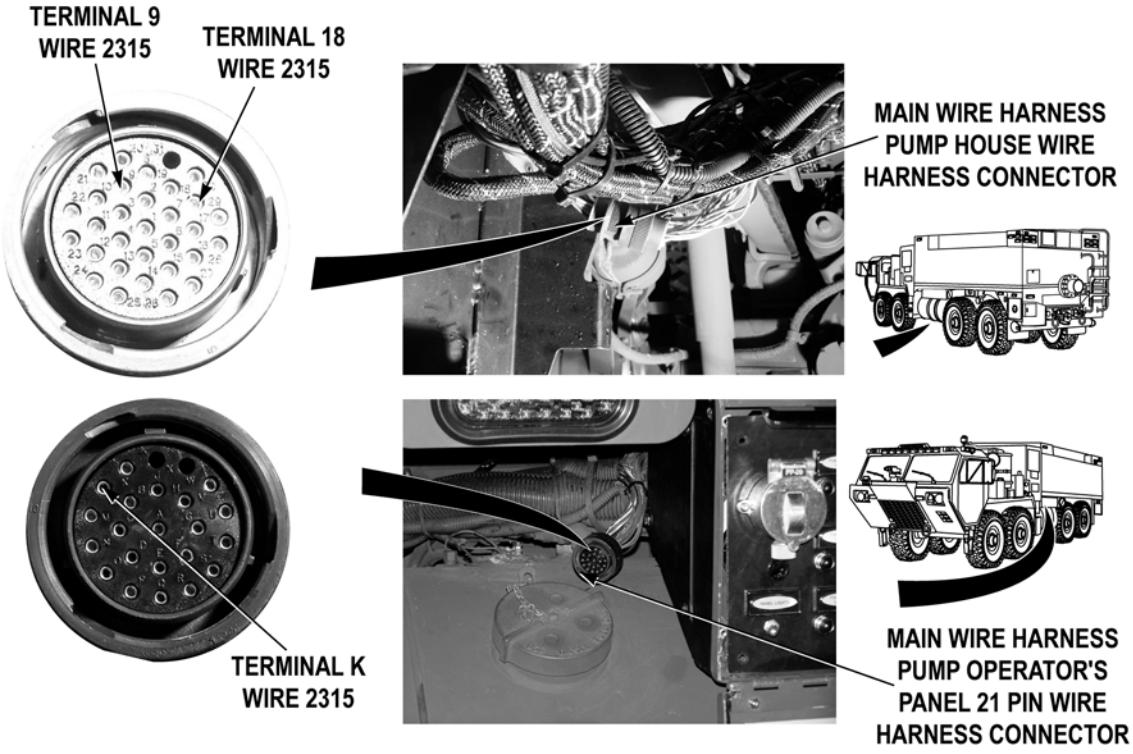
Step 35. Open pump operator's panel (WP 0205). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2314 (red) at DIRECT TANK FILL switch terminal and a known good ground.

If 22 to 28 VDC are not present, go to Step 39.

Step 36. Pull battery disconnect switch to off position (WP 0007). Check for continuity across pump operator's panel DIRECT TANK FILL switch from terminal wire 2314 (red) to terminal wire 2315 (yellow), when switch is in OPEN position.

If there is no continuity, replace DIRECT TANK FILL switch (WP 0219).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

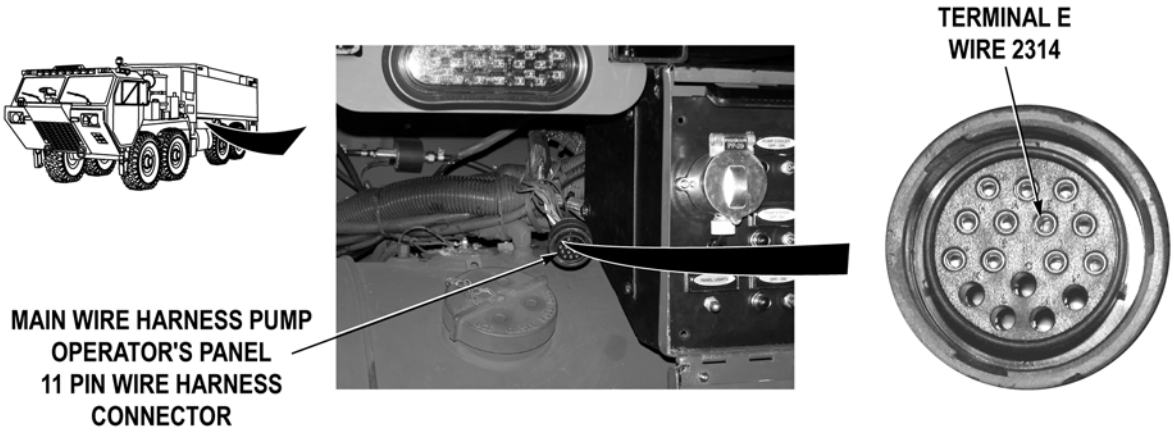


Step 37. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across main wire harness wire 2315 (yellow) from main wire harness pump house wire harness connector, terminal 18 and terminal 9 to main wire harness pump operator's panel 21 pin wire harness connector, terminal K.

a. If there is continuity, repair wire 2315 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, at either terminal repair wire 2315 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 38. Disconnect main wire harness pump operator's panel 11 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2314 (red) at main wire harness pump operator's panel 11 pin wire harness connector, terminal E and a known good ground.

a. If 22 to 28 VDC are present, repair wire 2314 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If 22 to 28 VDC are not present, repair wire 2314 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

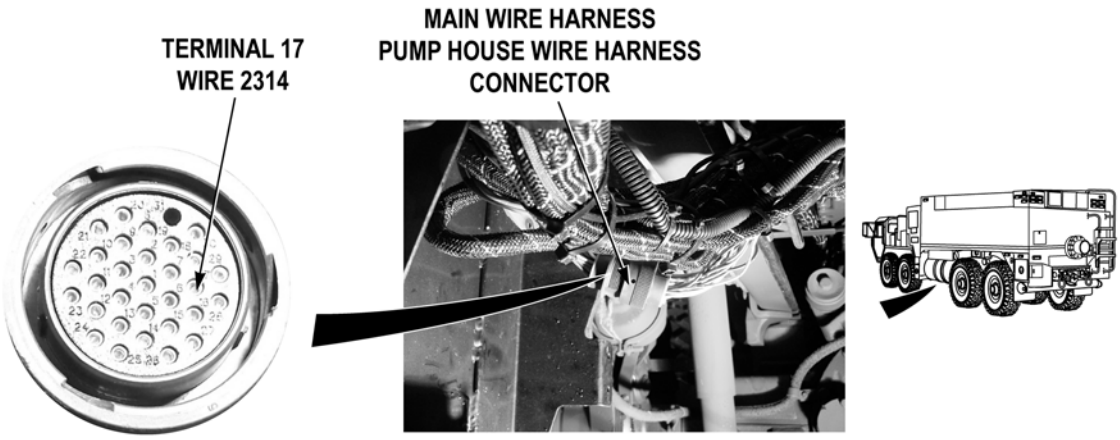
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 39. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 2314 (red) at connector DP2, terminal F and a known good ground.

If 22 to 28 VDC are not present, repair wire 2314 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 40. Reconnect pump house wire harness pump house power distribution wire harness connector DP2. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for 22 to 28 VCD between pump house wire harness wire 2314 (red) at main wire harness pump house wire harness, terminal 17 and a known good ground.

a. If 22 to 28 VDC are present, repair wire 2314 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If 22 to 28 VDC are not present, repair wire 2814 in pump house wire if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

DRIVER SIDE AUXILIARY INLET VALVE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

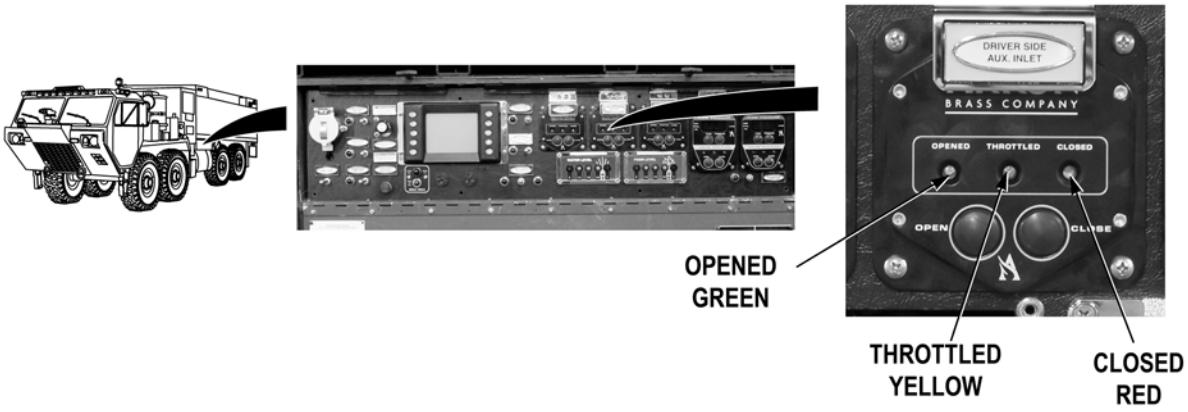
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0184
WP 0205

References (continued)
WP 0207
WP 0247
WP 0248
WP 0261
WP 0286
WP 0293
WP 0300
WP 0303
WP 0304
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DRIVER SIDE AUXILIARY INLET VALVE DOES NOT OPERATE PROPERLY



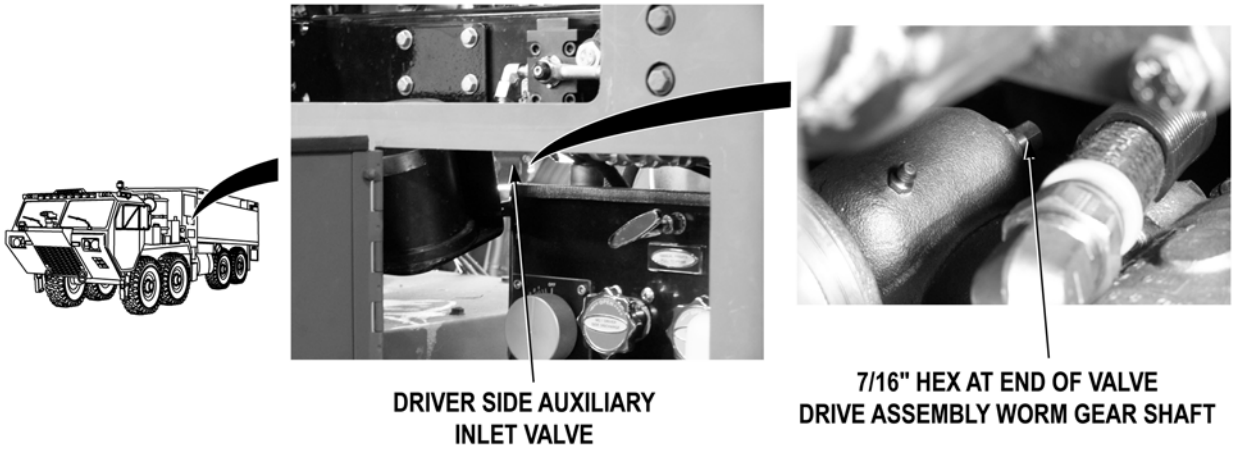
NOTE

Ensure batteries are fully charged before performing Step 1.

Step 1. Push battery disconnect switch to on position (WP 0007). Check if pump operator's panel DRIVER SIDE AUX. INLET valve control display illuminates (WP 0004).

If display is not illuminated, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



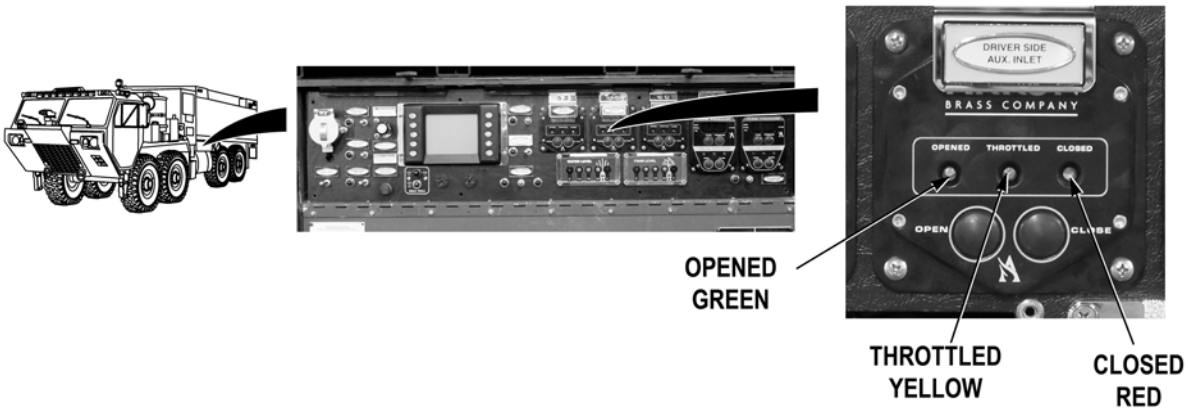
NOTE

- Valve operation can be checked either by noting vibration of valve assembly, or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from DRIVER SIDE AUX. INLET. Water may be released from system when valve is operated.

Step 2. Open driver side pump house controls access door (WP 0008). While an assistant pushes pump operator’s panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if driver side auxiliary inlet valve operates.

If driver side auxiliary inlet valve does not open and close, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



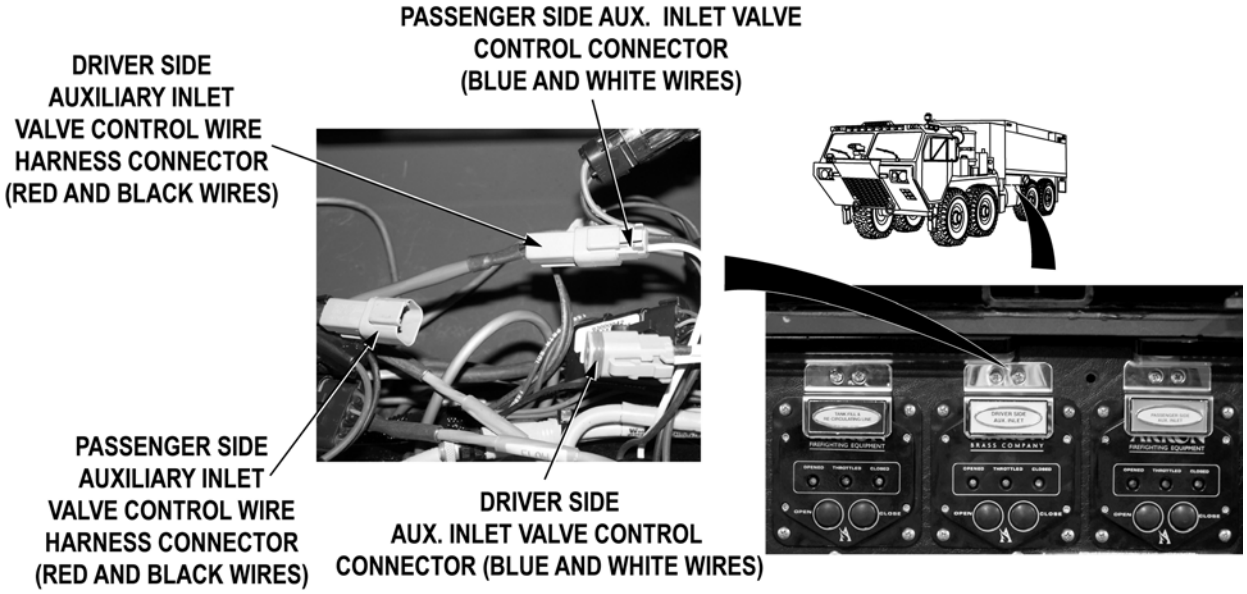
NOTE

DRIVER SIDE AUX. INLET valve control will indicate yellow ‘THROTTLED’ indicator when valve is partially opened or closed.

Step 3. While an assistant monitors operation of driver side auxiliary inlet valve, push pump operator’s panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004). Check if DRIVER SIDE AUX. INLET valve control OPENED (green) and CLOSED (red) indicators illuminate before valve is fully opened or closed.

If DRIVER SIDE AUX. INLET valve control indicators illuminate before driver side auxiliary valve is fully opened or closed, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 4. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect valve control wire harness connector from DRIVER SIDE AUX. INLET valve control. Disconnect valve control wire harness connector from PASSENGER SIDE AUX. INLET valve control. Connect driver side auxiliary inlet valve control wire harness connector to PASSENGER SIDE AUX. INLET valve control. Push battery disconnect switch to on position (WP 0007). While an assistant monitors operation of driver side auxiliary inlet valve, push pump operator's panel PASSENGER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004). Check if PASSENGER SIDE AUX. INLET valve control OPENED (green) and CLOSED (red) indicators illuminate before driver side auxiliary inlet valve is fully opened or closed.

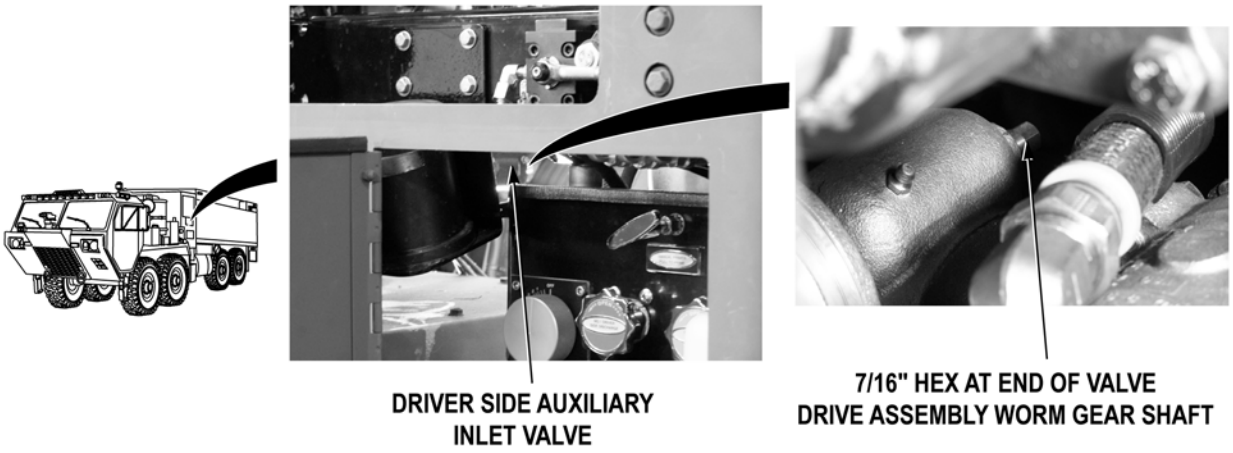
If PASSENGER SIDE AUX. INLET valve control indicators do not illuminate before driver side auxiliary inlet valve is fully opened or closed, reconnect valve control wire harnesses to original positions and replace DRIVER SIDE AUX. INLET valve control (WP 0207).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 5. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel E (WP 0341). Remove driver side auxiliary inlet valve (WP 0184) and inspect it for binding, damage, and contamination.

a. If driver side auxiliary inlet valve is free from binding, damage, and contamination, reinstall valve (WP 0184) and replace driver side auxiliary inlet valve motor and drive assembly (WP 0247).

b. If driver side auxiliary inlet valve is not free from binding, damage, or contamination, repair (WP 0248) or replace driver side auxiliary inlet valve (WP 0184).



NOTE

Valve operations must be checked by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft for Step 6.

Step 6. While an assistant pushes pump operator’s panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if driver side auxiliary inlet valve worm gear shaft moves after valve is fully opened or closed.

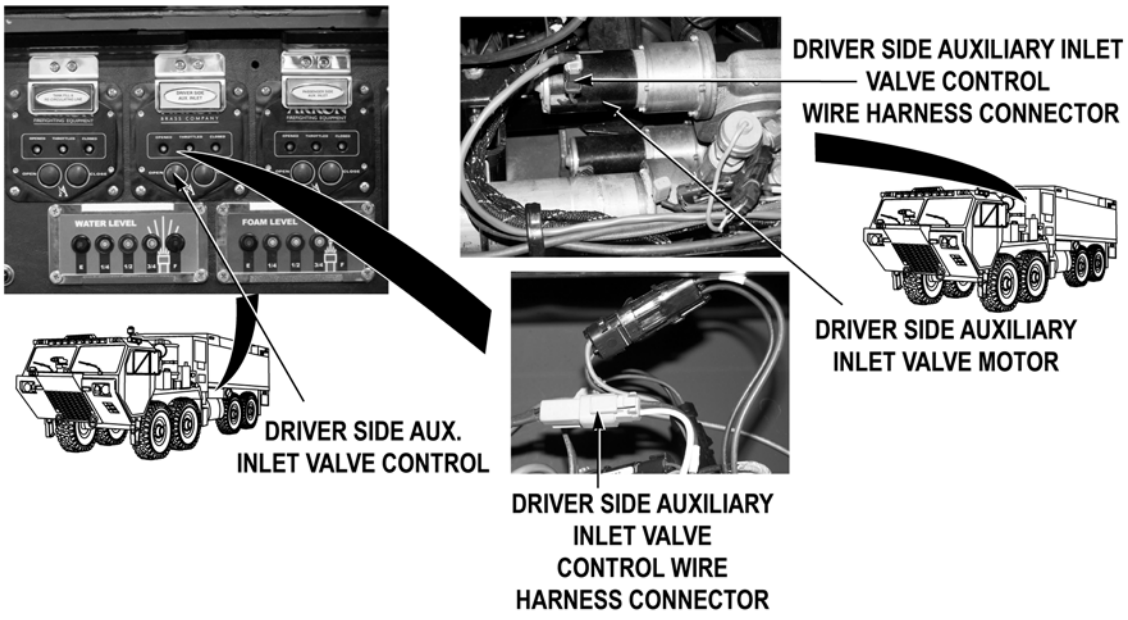
If driver side auxiliary inlet valve worm gear shaft moves excessively after valve is fully opened or closed, remove and reinstall driver side auxiliary inlet valve motor (WP 0247), ensuring all mounting hardware is secure.

Step 7. Remove pump house panel E (WP 0341). Remove driver side auxiliary inlet valve (WP 0184) and inspect it for damage and contamination.

a. If driver side auxiliary inlet valve is free from damage and contamination, reinstall valve (WP 0184) and go to Step 8.

b. If driver side auxiliary inlet valve is damaged and/or contaminated, repair (WP 0248) or replace driver side auxiliary inlet valve (WP 0184).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 8. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel E (WP 0341). Open pump operator's panel (WP 0205). Check driver side auxiliary inlet valve control wire harness from DRIVER SIDE AUX. INLET valve control to driver side auxiliary inlet valve motor for loose connections.

If connections are loose, reconnect driver side auxiliary inlet valve control wire harness connectors (WP 0286).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

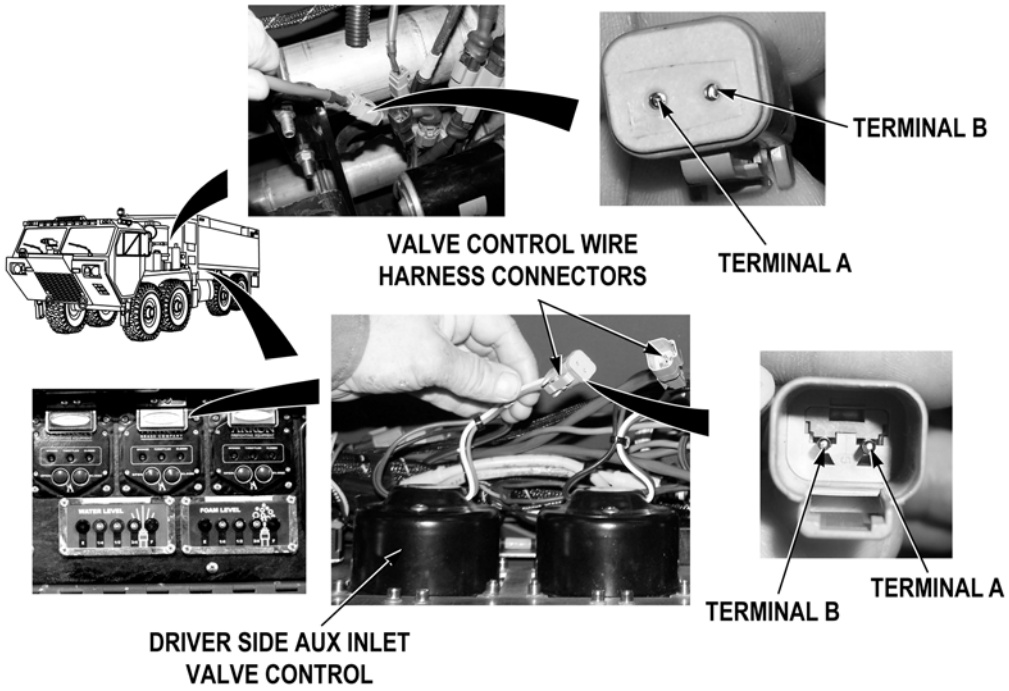
NOTE

- Do not engage PUMP PTO during procedure. Valve operations cab be checked without water pump operations.
- Valve motor operation can be checked either by noting vibration of valve assembly, or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from DRIVER SIDE AUX. INLET. Water may be released from system when valve is operated.

Step 9. Push battery disconnect switch to on position (WP 0007). While an assistant pushes pump operator’s panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if DRIVER SIDE AUX. INLET valve control THROTTLED (yellow) indicator illuminates and driver side auxiliary inlet valve motor operates.

If indicator illuminates and valve motor operates, replace driver side auxiliary inlet valve drive assembly (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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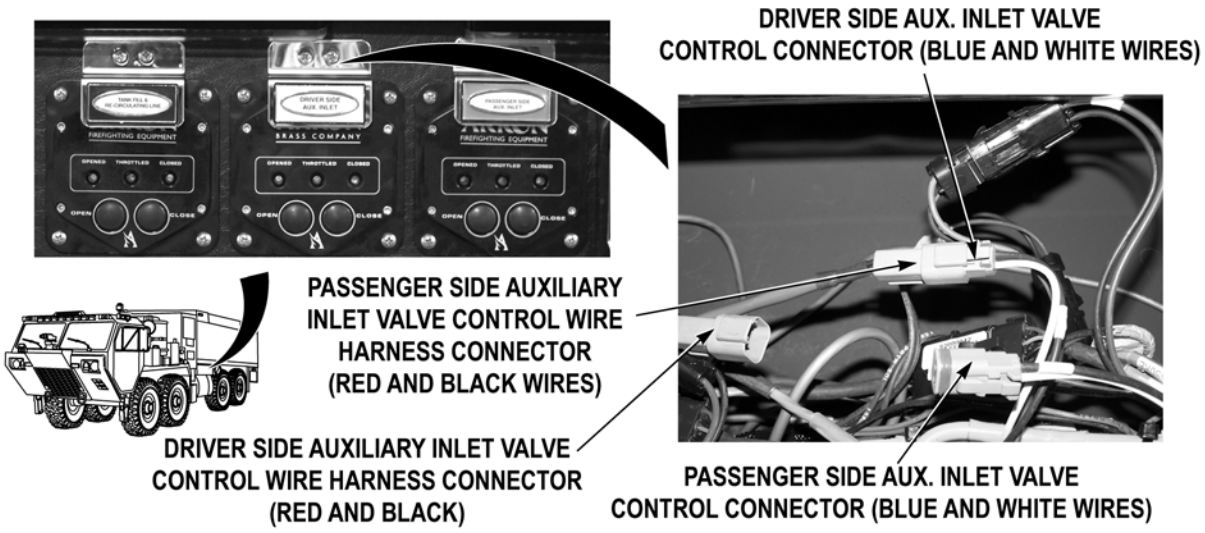
Step 10. Pull battery disconnect switch to off position (WP 0007). Disconnect valve control wire harness connector from DRIVER SIDE AUX. INLET valve control. Disconnect valve control wire harness connector from driver side auxiliary inlet valve motor. With a test lead set, check for continuity across valve control wire harness from DRIVER SIDE AUX. INLET valve control connector to driver side auxiliary inlet valve motor connector.

If there is no continuity, repair valve control wire harness if repairable (TM 9-2320-315-14&P), or replace driver side auxiliary inlet valve control wire harness (WP 0286).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

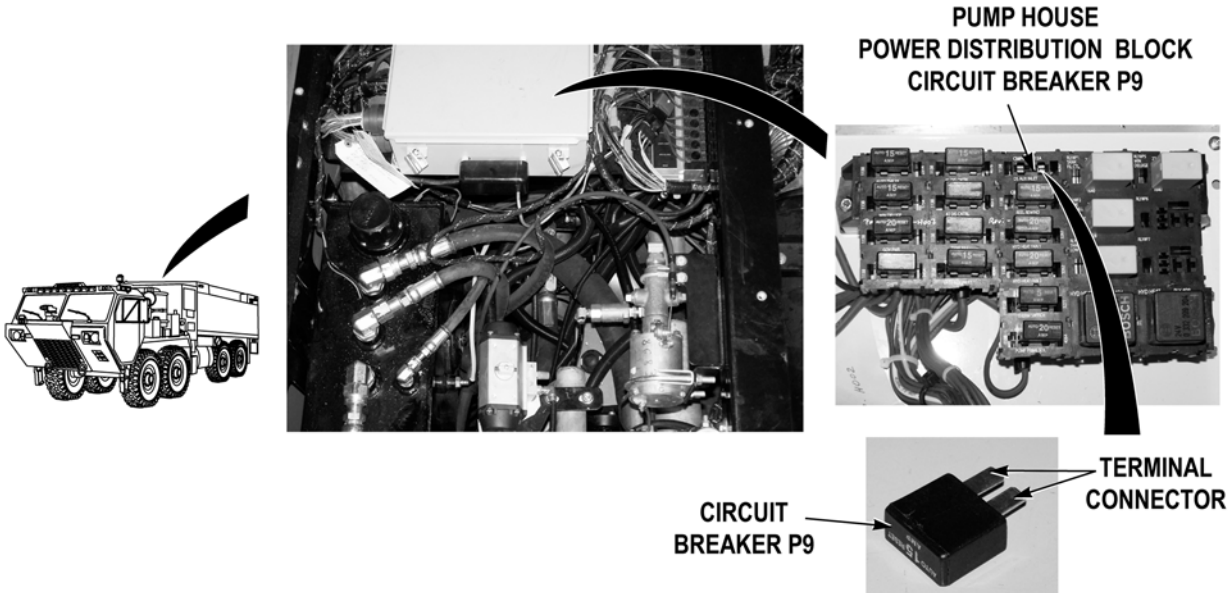


Step 11. Connect valve control wire harness connector to driver side auxiliary inlet valve motor. Disconnect valve control wire harness connector from PASSENGER SIDE AUX. INLET valve control. Connect driver side auxiliary inlet valve control wire harness connector to PASSENGER SIDE AUX. INLET valve control. While an assistant pushes pump operator's panel PASSENGER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if driver side auxiliary inlet valve operates.

a. If driver side auxiliary inlet valve operates, reconnect valve control wire harnesses to original positions and replace DRIVER SIDE AUX. INLET valve control (WP 0207).

b. If driver side auxiliary inlet valve does not operate, reconnect valve control wire harnesses to original positions and replace driver side auxiliary inlet valve motor (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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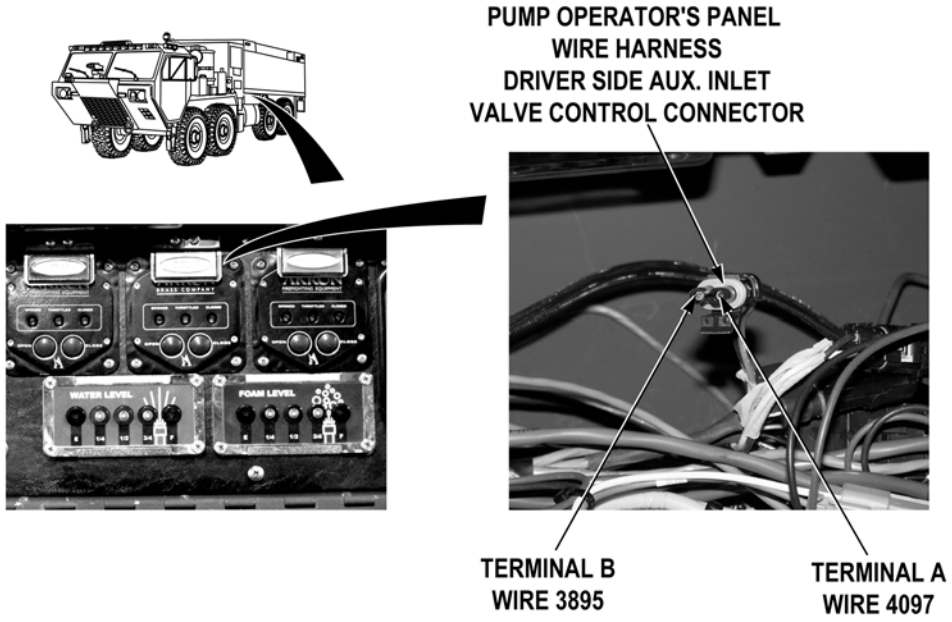
Step 12. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P9 (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P9 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Install circuit breaker P9 (WP 0261). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness DRIVER SIDE AUX. INLET valve control connector. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump operator's panel wire harness wire 4097 (orange) at DRIVER SIDE AUX. INLET valve control connector, terminal A and a known good ground.

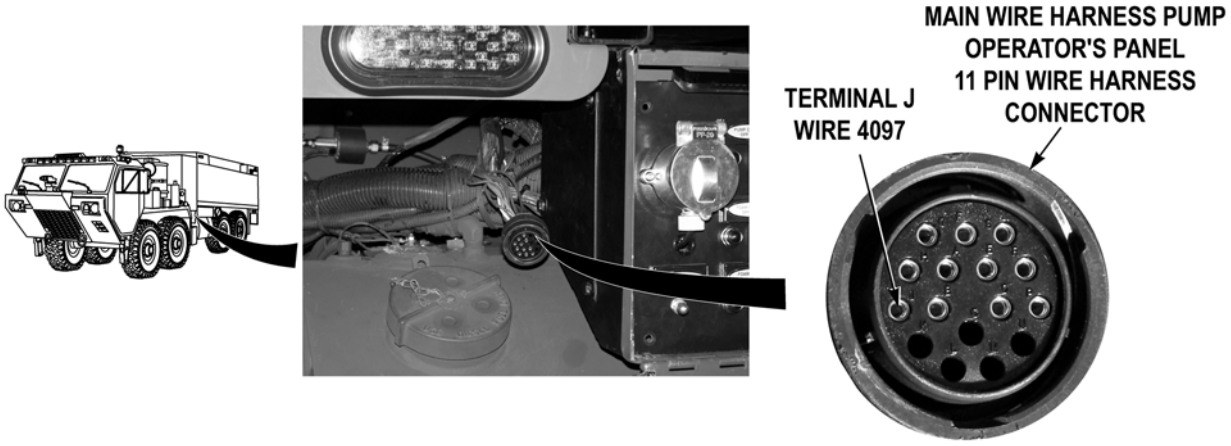
If 22 to 28 VDC are not present, go to Step 15.

Step 14. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 3895 (black) from pump operator's panel wire harness DRIVER SIDE AUX. INLET valve control connector, terminal B and a known good ground.

a. If there is continuity, replace DRIVER SIDE AUX. INLET valve control (WP 0207).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

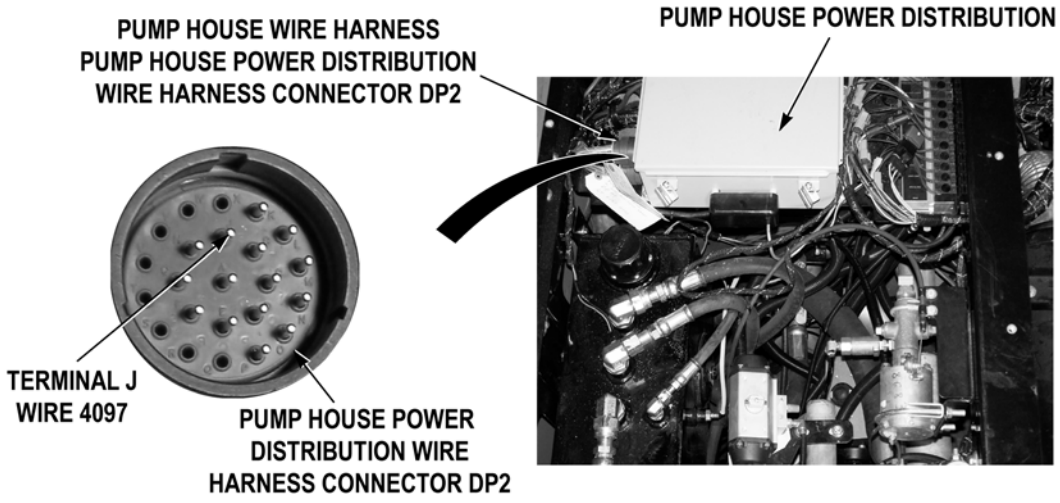
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Disconnect main wire harness pump operator’s panel 11 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 4097 (orange) at main wire harness pump operator’s panel 11 pin wire harness connector, terminal J and a known good ground.

If 22 to 28 VDC are present, repair wire 4097 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 4097 (orange) at connector DP2, terminal J and a known good ground.

If 22 to 28 VDC are not present, repair wire 4097 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 17. Reconnect pump house wire harness pump house power distribution wire harness connector DP2. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4097 (orange) at main wire harness pump house wire harness connector, terminal 24 and a known good ground.

a. If 22 to 28 VDC are present, repair wire 4097 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If 22 to 28 VDC are not present, repair wire 4097 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

HOSE REEL REWIND CONTROL DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0009
WP 0072
WP 0250
WP 0251

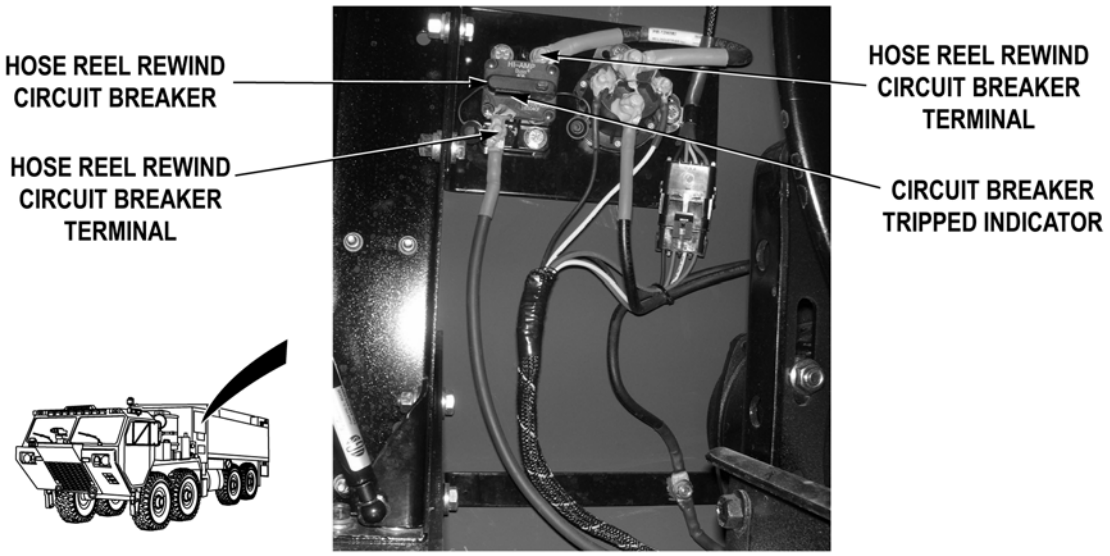
References (continued)
WP 0252
WP 0253
WP 0263
WP 0293
WP 0303
WP 0334
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HOSE REEL REWIND CONTROL DOES NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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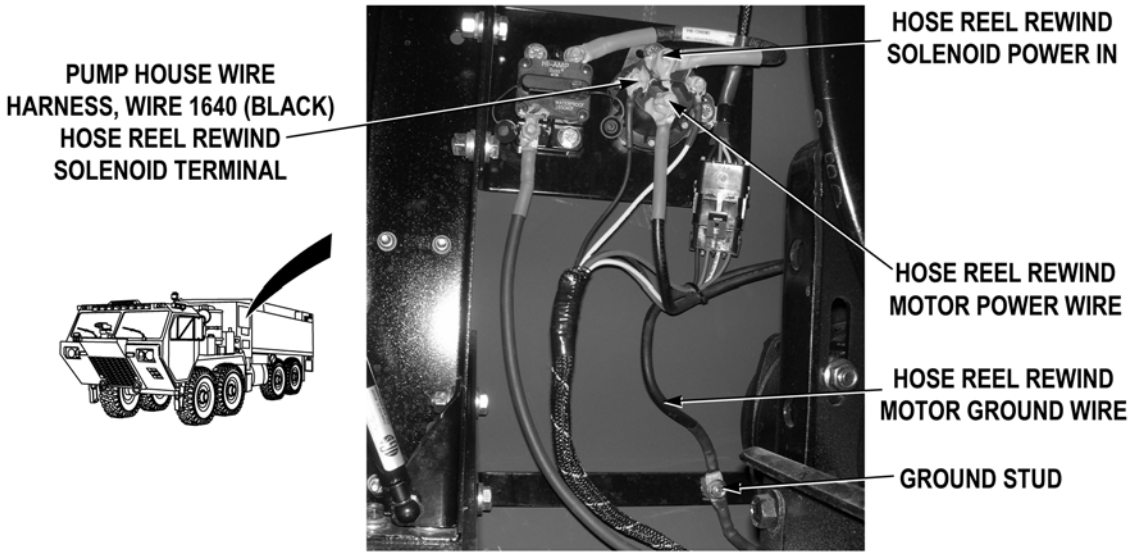
Step 1. Open pump house access door assembly (WP 0009). Check if hose reel rewind circuit breaker is tripped.

If hose reel rewind circuit breaker is tripped, reset circuit breaker.

Step 2. Disconnect batteries (TM 9-2320-315-14&P). Check for continuity across hose reel rewind circuit breaker from terminal to terminal.

If there is no continuity, replace hose reel rewind circuit breaker (WP 0251).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Check for continuity across pump house wire harness wire 1640 (black), from hose reel rewind solenoid ground terminal to a known good ground.

If there is no continuity, repair wire 1640 (black) in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 4. Reconnect batteries (TM 9-2320-315-14&P). Check for 22 to 28 VDC between hose reel rewind solenoid power to a known good ground.

If 22 to 28 VDC are not present, go to Step 12.

Step 5. Remove hose reel rewind motor power wire from hose reel rewind solenoid (WP 0250). Push battery disconnect switch to on position (WP 0007). While an assistant pushes and holds REEL REWIND button, check for 22 to 28 VDC between hose reel rewind motor power wire at hose reel rewind solenoid terminal and a known good ground. Install hose reel rewind motor power wire on hose reel rewind solenoid (WP 0250).

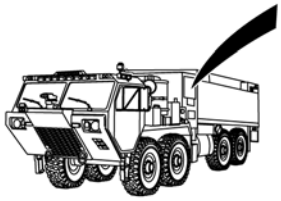
If 22 to 28 VDC are not present, go to Step 7.

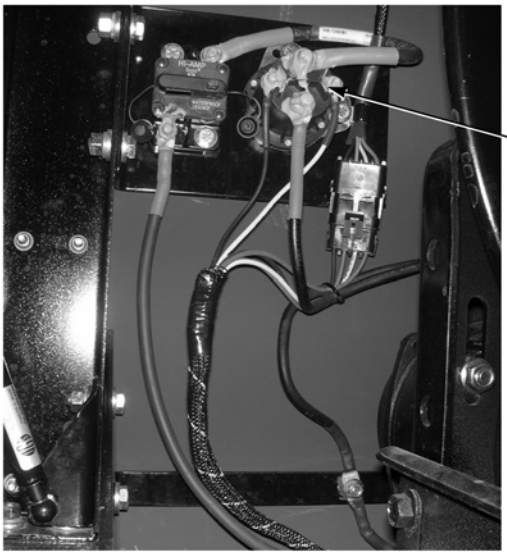
Step 6. Pull battery disconnect switch to off position (WP 0007). Check for continuity across hose reel rewind motor ground wire (black) from ground stud to a known good ground.

a. If there is continuity, replace hose reel motor (WP 0334).

b. If there is no continuity, repair hose reel ground wire from chassis ground terminal block to ground stud (TM 9-2320-315-14&P), or replace hose reel ground wire (WP 0250).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

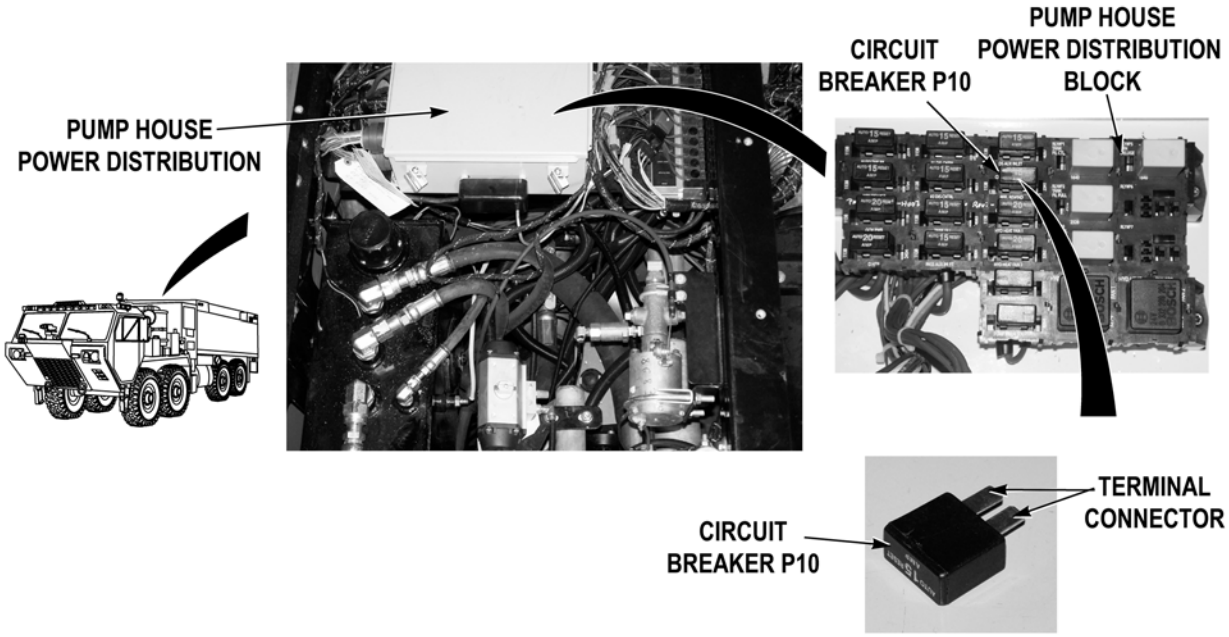




Step 7. While an assistant pushes and holds REEL REWIND button (WP 0004), check for 22 to 28 VDC between pump house wire harness wire 1664 (yellow) at hose reel rewind solenoid terminal and a known good ground.

If 22 to 28 VDC are present, replace hose reel rewind solenoid (WP 0253).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



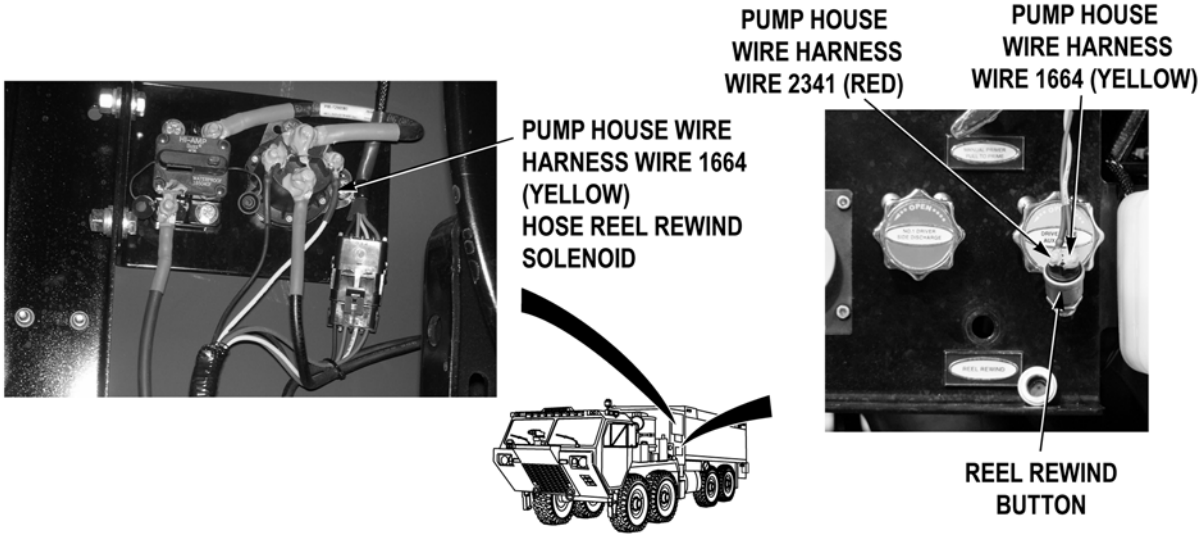
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Release REEL REWIND button (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P10 from pump house power distribution block (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P10 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



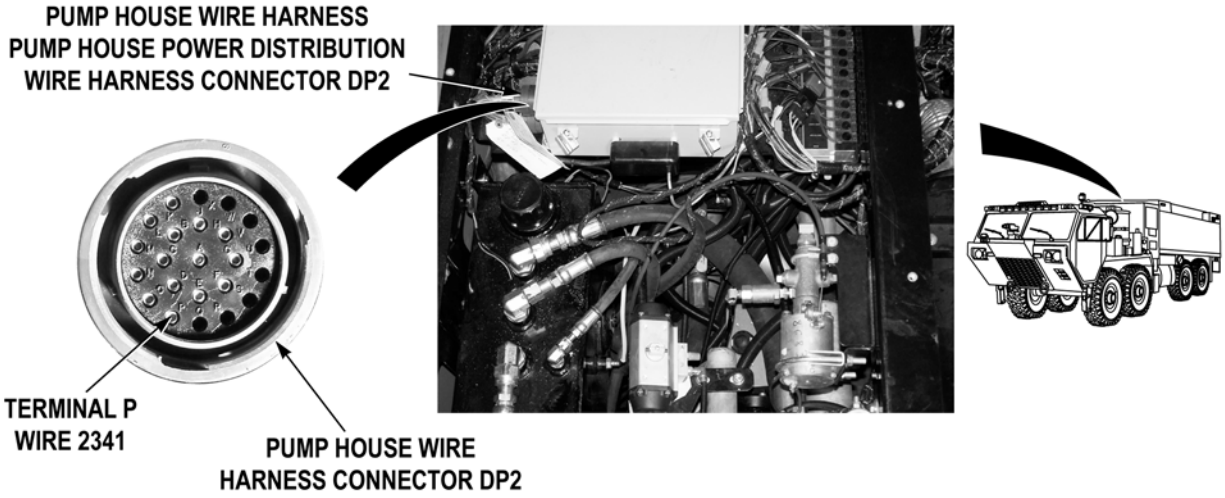
Step 9. Install circuit breaker P10 (WP 0261). Remove REEL REWIND button (WP 0252). Check for continuity across pump house wire harness wire 1664 (yellow) from REEL REWIND button terminal to hose reel rewind solenoid terminal.

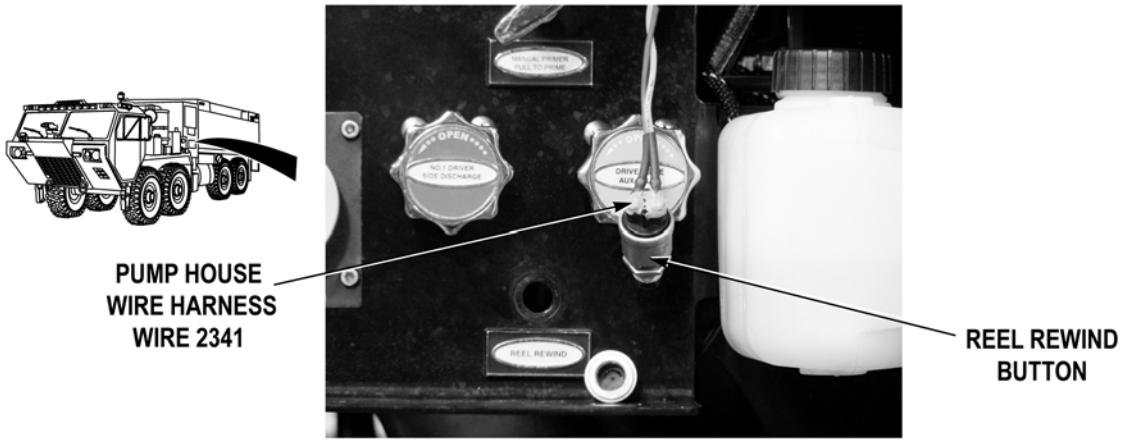
If there is no continuity, repair wire 1664 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 10. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump house wire harness wire 2341 (red) at REEL REWIND button terminal and a known good ground.

If 22 to 28 VDC are present, replace REEL REWIND button (WP 0252).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





Step 11. Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness pump house power distribution wire harness connector DP2. Check for continuity across pump house wire harness wire 2341 (red) from pump house wire harness connector DP2, terminal P to REEL REWIND button terminal.

a. If there is continuity, repair wire 2341 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0263).

b. If there is no continuity, repair wire 2341 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

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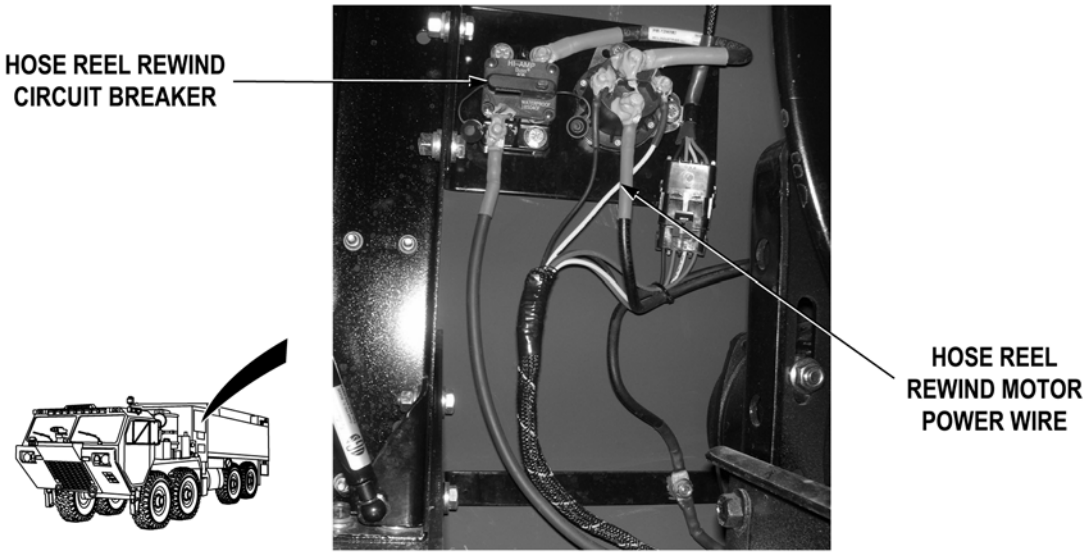
NOTE

Primer pump operation can be checked by noting the loud and distinguishable audible vibration of primer pump.

Step 12. Push pump operator's panel DRIVER MAIN INLET PRIMER button (WP 0004). Check for primer pump operation.

If primer pump does not operate when pump operator's panel DRIVER MAIN INLET PRIMER button is pushed, troubleshoot Pump Priming System Does Not Operate Properly (WP 0072).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Check for 22 to 28 VDC between hose reel rewind motor power wire at hose reel rewind circuit breaker and a known good ground.

a. If 22 to 28 VDC are present, replace hose reel rewind motor power wire between hose reel rewind circuit breaker and hose reel rewind solenoid (WP 0253).

b. If 22 to 28 VDC are not present, repair wire if repairable (TM 9-2320-315-14&P), or replace hose reel rewind motor power wire between pump house B+ stud and hose reel rewind circuit breaker (WP 0250).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

HOSE REEL DISCHARGE VALVE DOES NOT OPERATE WHEN SELECTED

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0024
WP 0205
WP 0218
WP 0240

References (continued)
WP 0270
WP 0280
WP 0293
WP 0303
WP 0304
WP 0319
WP 0322
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

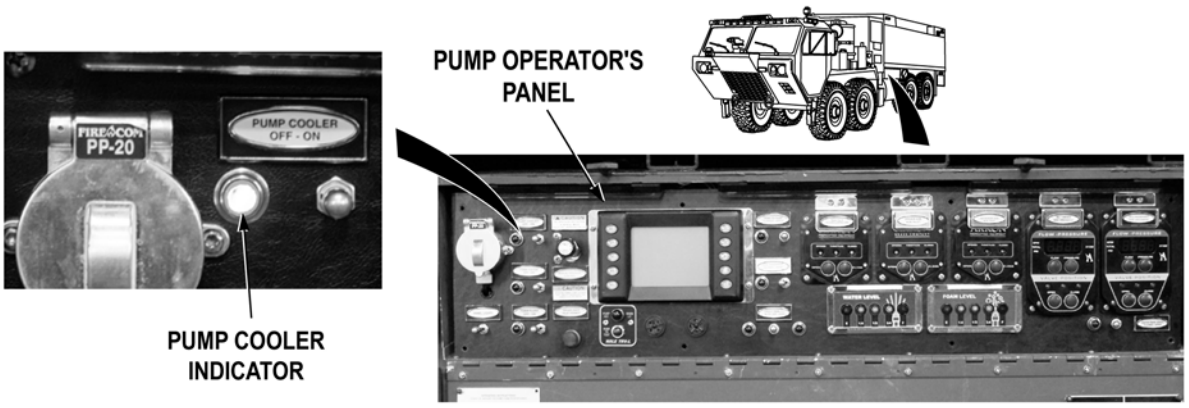
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HOSE REEL DISCHARGE VALVE DOES NOT OPERATE WHEN SELECTED

Step 1. Unwind hose from hose reel (WP 0024). Check hose for kinks and damage.

If hose is kinked or damaged, remove kinks or replace damaged hose (WP 0322).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



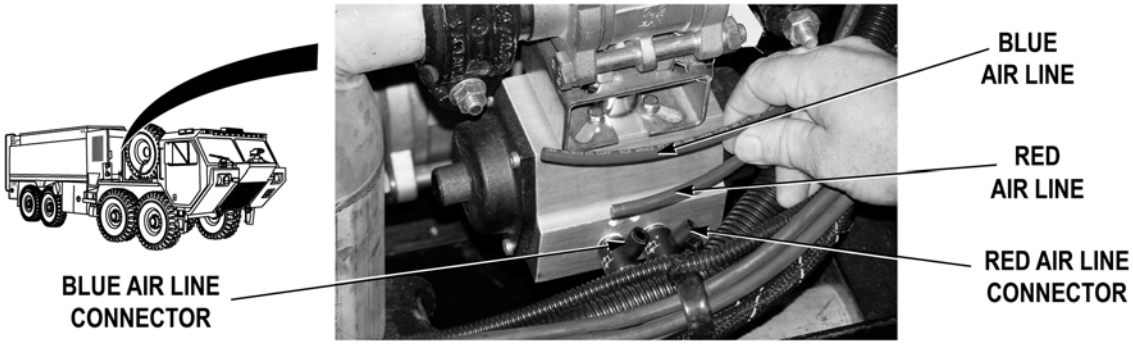
Step 2. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel PUMP COOLER switch to ON position (WP 0004). Check if pump operator's panel PUMP COOLER indicator illuminates.

If pump operator's panel PUMP COOLER indicator does not illuminate, go to Step 12.

Step 3. Put PUMP COOLER switch to OFF position (WP 0004). Remove pump house panel G (WP 0341). Inspect air lines from air control valve manifold to hose reel discharge valve for kinks and damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

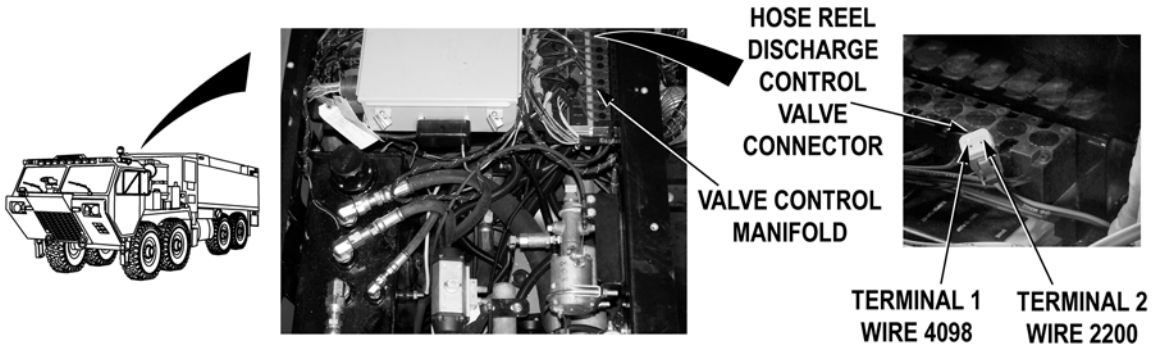
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Air pressure is checked by disconnecting air lines at hose reel discharge valve and observing air pressure escaping from air lines, when hose reel discharge control valve is activated. Air will escape from blue air line when REEL DISCHARGE switch is put to OPEN position, and escape from red air line when REEL DISCHARGE switch is put to CLOSED position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 4. If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Disconnect air lines at hose reel discharge valve. While an assistant puts pump operator's panel REEL DISCHARGE switch to OPEN and CLOSE positions (WP 0004), check if air pressure is present at hose reel discharge valve.

If there is air pressure, replace hose reel discharge valve (WP 0319).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 5. Connect air lines at hose reel discharge valve. Remove pump house panel K (WP 0341). Disconnect pump house wire harness hose reel discharge control valve connector. Put pump operator's panel REEL DISCHARGE switch to OPEN position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4098 (green) at pump house wire harness hose reel discharge control valve connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, go to Step 7.

Step 6. Put pump operator's panel REEL DISCHARGE switch to CLOSED position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness hose reel discharge control valve connector, terminal 2 to a known good ground.

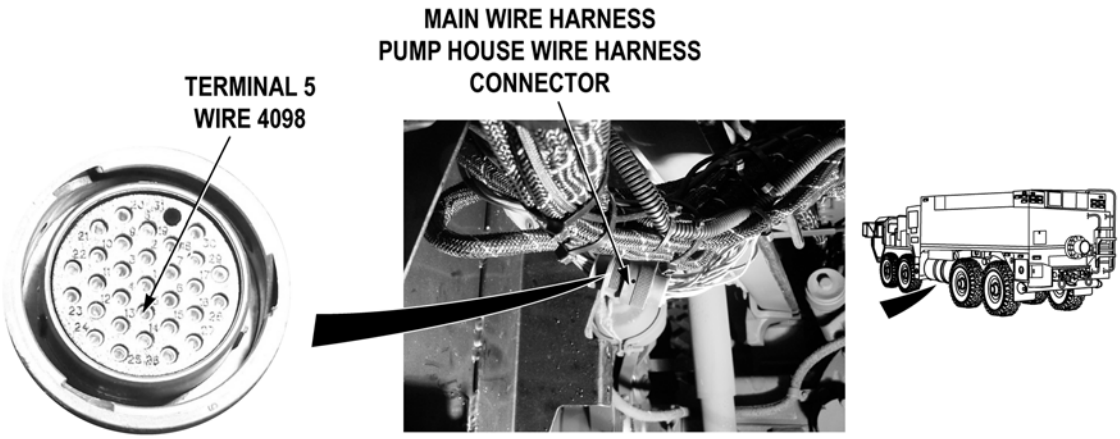
a. If there is continuity, replace hose reel discharge control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 7. Check if pump operator's panel REEL DISCHARGE indicator is illuminated (WP 0004).

If indicator is not illuminated, go to Step 10.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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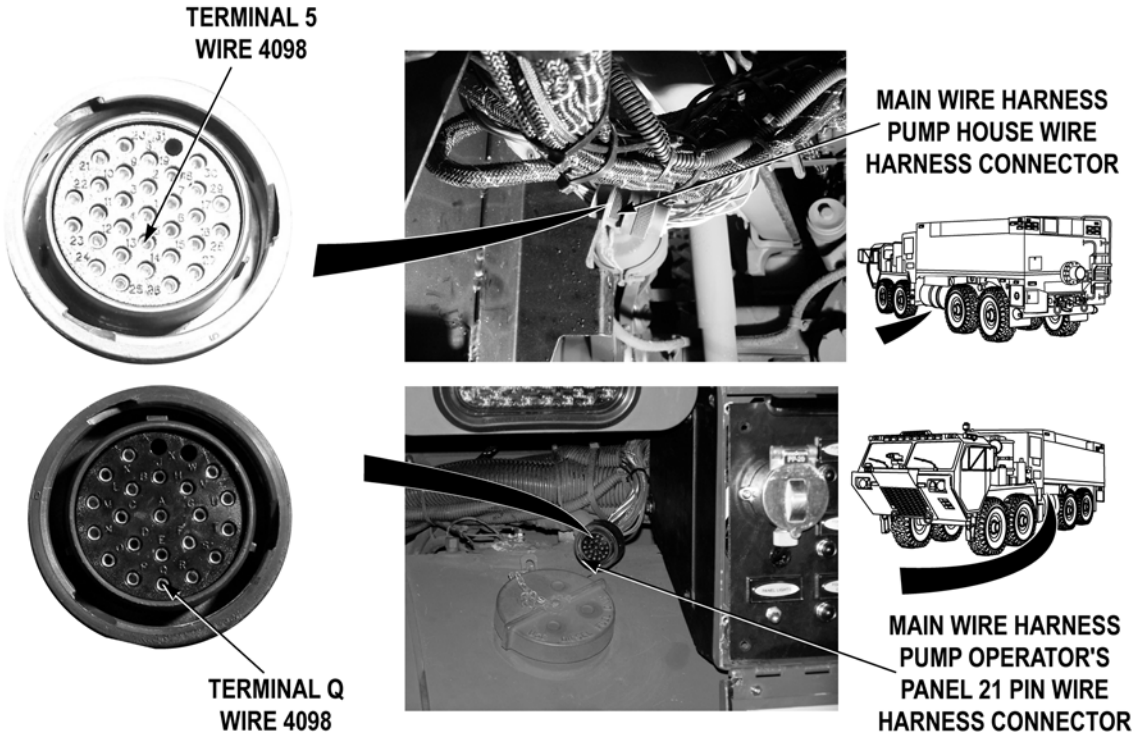
Step 8. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 4098 (green) at main wire harness pump house wire harness connector, terminal 5 and a known good ground.

If 22 to 28 VDC are present, repair wire 4098 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

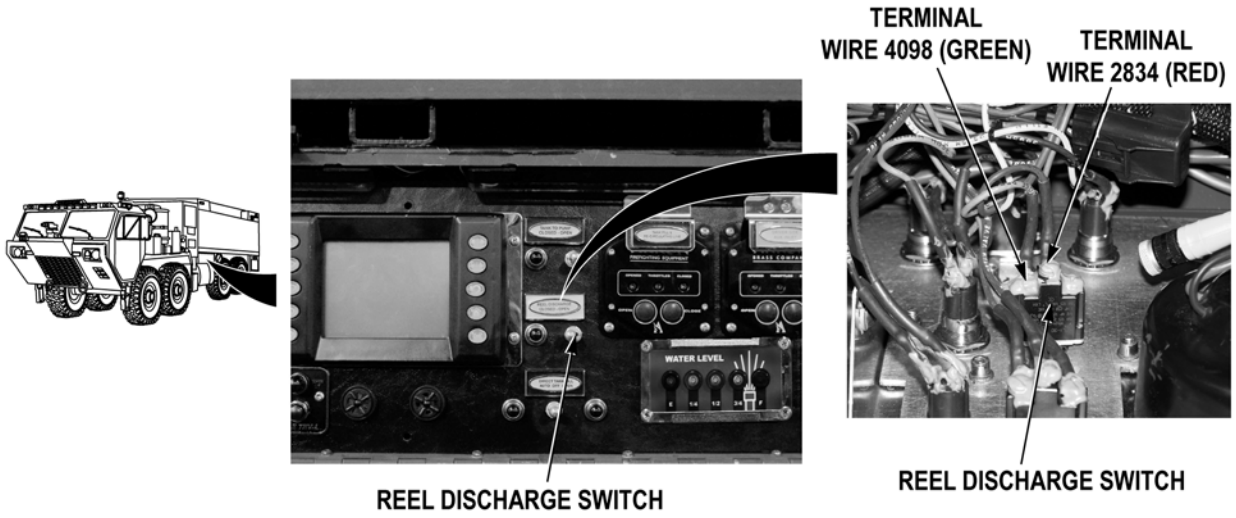


Step 9. Put pump operator's panel REEL DISCHARGE switch to CLOSED position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for continuity across main wire harness wire 4098 (green) from main wire harness pump operator's panel 21 pin wire harness connector, terminal Q to main wire harness pump house wire harness connector, terminal 5.

a. If there is continuity, repair wire 4098 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 4098 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 10. Open pump operator's panel (WP 0205). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2834 (red) at REEL DISCHARGE switch terminal and a known good ground.

If 22 to 28 VDC are not present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 11. Pull battery disconnect switch to off position (WP 0007). Put pump operator's panel REEL DISCHARGE switch to OPEN position (WP 0004), check for continuity across REEL DISCHARGE switch from terminal to terminal.

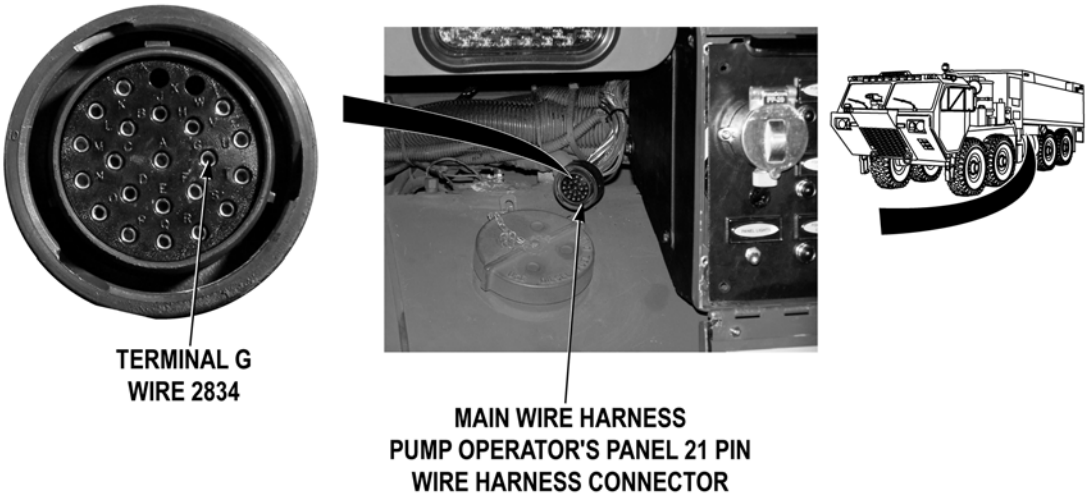
a. If there is continuity, repair wire 4098 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, replace REEL DISCHARGE switch (WP 0218).

Step 12. Put pump operator's panel PUMP COOLER switch to ON position (WP 0004). Check if cab PUMP COOLER indicator illuminates.

If cab PUMP COOLER indicator does not illuminate, go to Step 15.

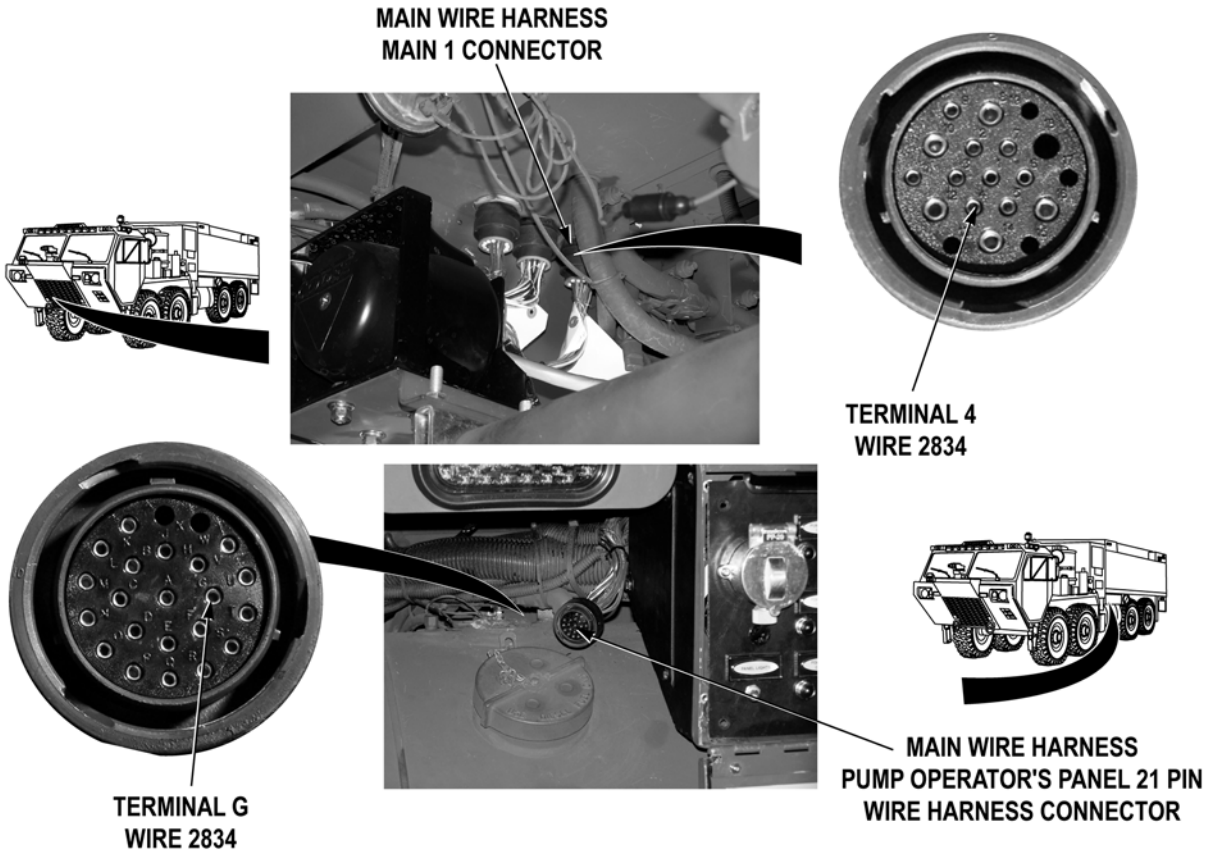
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Put cab PUMP COOLER switch to off position (WP 0004). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2834 (red) at pump operator's panel 21 pin wire harness connector, terminal G and a known good ground.

If 22 to 28 VDC are present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

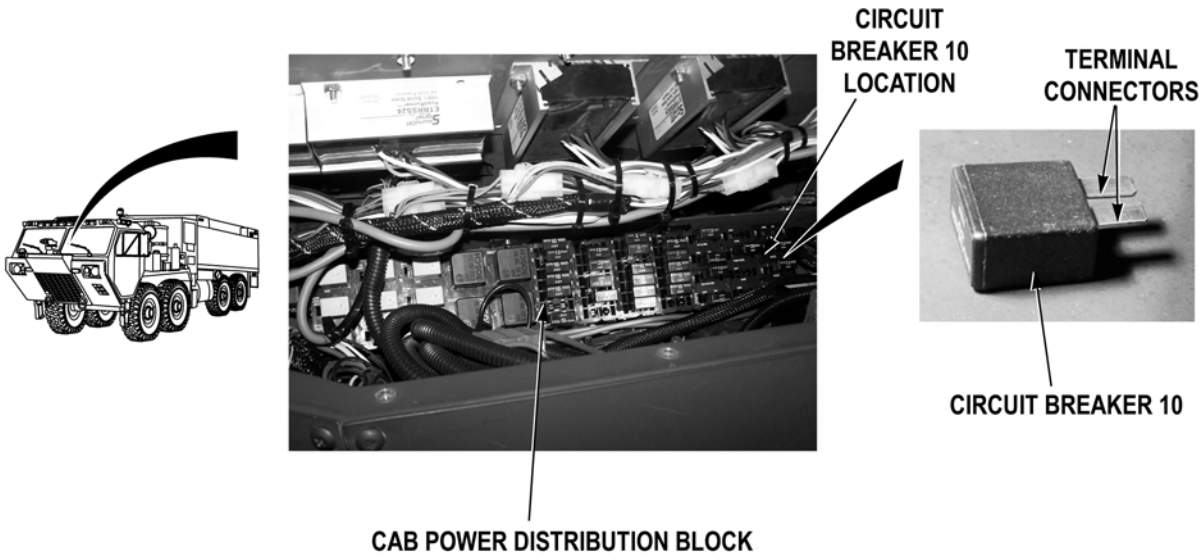


Step 14. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 2834 (red) from main 1 connector, terminal 4 to main wire harness pump operator's panel 21 pin wire harness connector, terminal G.

a. If there is continuity, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2834 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 15. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 10 from cab power distribution block (WP 0240). Check for continuity across circuit breaker.

a. If there is continuity, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, replace circuit breaker 10 (WP 0240).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

NO. 1 DRIVER SIDE DISCHARGE VALVE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0205
WP 0208
WP 0244

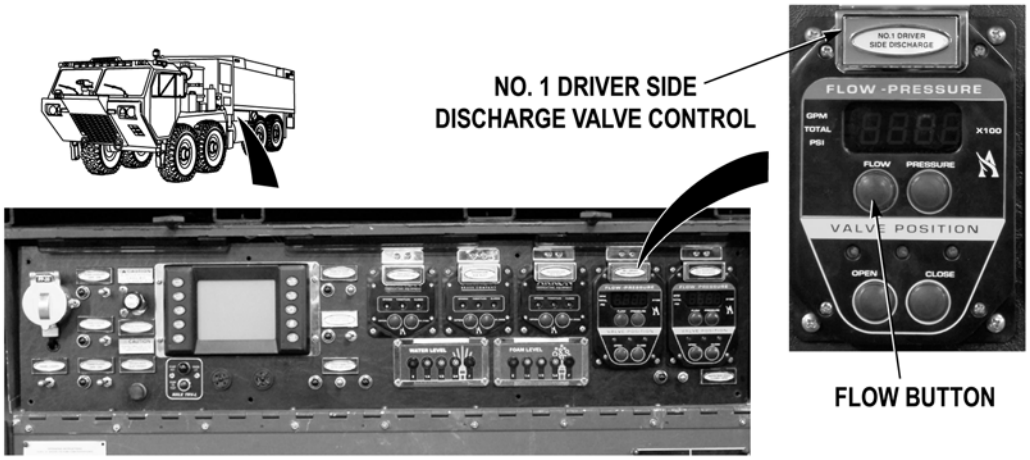
References (continued)
WP 0247
WP 0248
WP 0249
WP 0261
WP 0285
WP 0293
WP 0300
WP 0304
WP 0316
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NO. 1 DRIVER SIDE DISCHARGE VALVE DOES NOT OPERATE PROPERLY

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



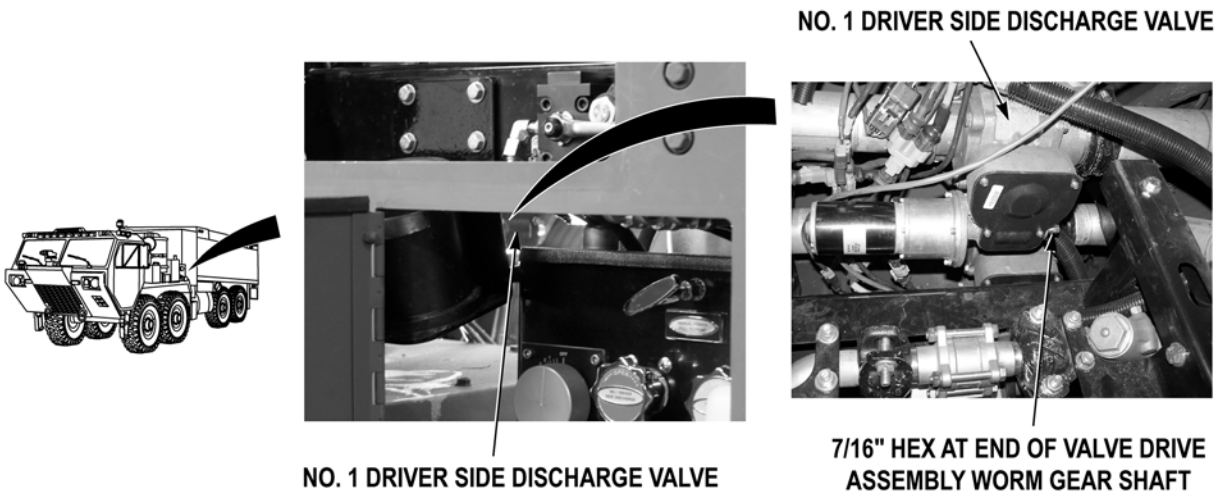
NOTE

Ensure batteries are fully charged before performing Step 1.

Step 1. Push battery disconnect switch to on position (WP 0007). Check if pump operator's panel NO. 1 DRIVER SIDE DISCHARGE valve control display illuminates.

If display is not illuminated, go to Step 17.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

- Valve operation can be checked by noting vibration of valve assembly, or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from NO. 1 DRIVER SIDE DISCHARGE. Water may be released from system when valve is operated.

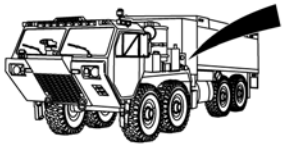
Step 2. Open pump house controls access door (WP 0008). While an assistant pushes pump operator’s panel NO. 1 DRIVER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004), check if No. 1 driver side discharge valve operates to open and close positions.

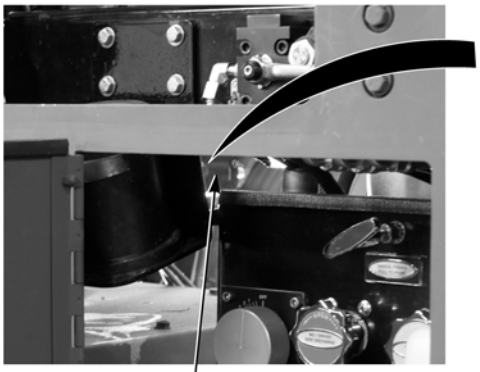
If No. 1 driver side discharge valve does not operate to open and close positions, go to Step 9.

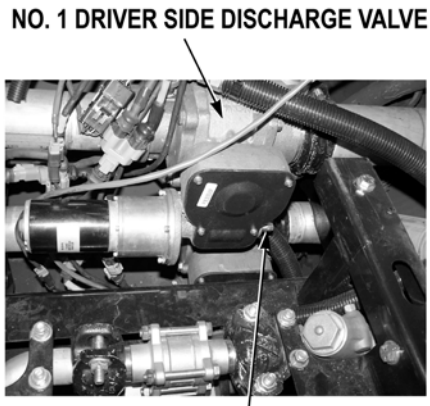
Step 3. While an assistant monitors the operation of No. 1 driver side discharge valve. Push pump operator’s panel NO. 1 DRIVER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004). Check if NO. 1 DRIVER SIDE DISCHARGE valve control opened (green) and closed (red) indicators illuminate before No. 1 driver side discharge valve is fully open and closed.

If NO. 1 DRIVER SIDE DISCHARGE valve control indicators illuminate before No. 1 driver side discharge valve is fully opened or closed, go to Step 13.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION







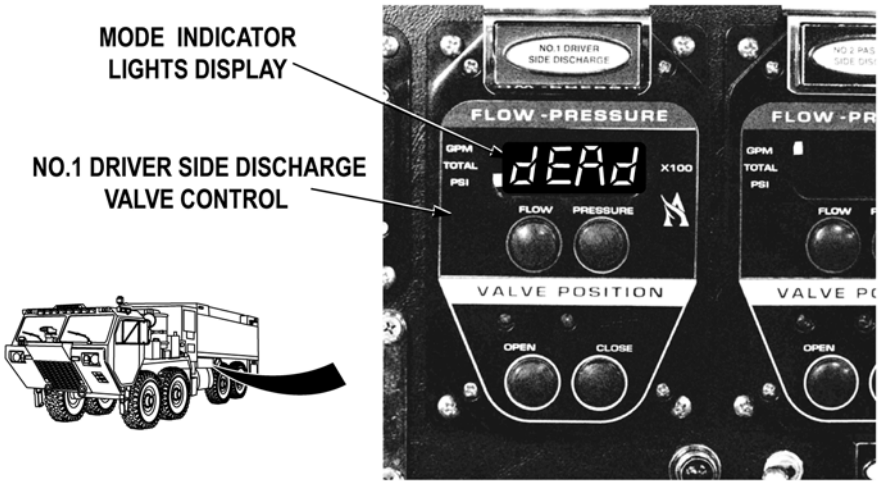
NOTE

Valve operations must be checked by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft for Step 4.

Step 4. While an assistant pushes pump operator’s panel NO. 1 DRIVER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004), check if No. 1 driver side discharge valve worm gear shaft moves after valve is fully opened or closed.

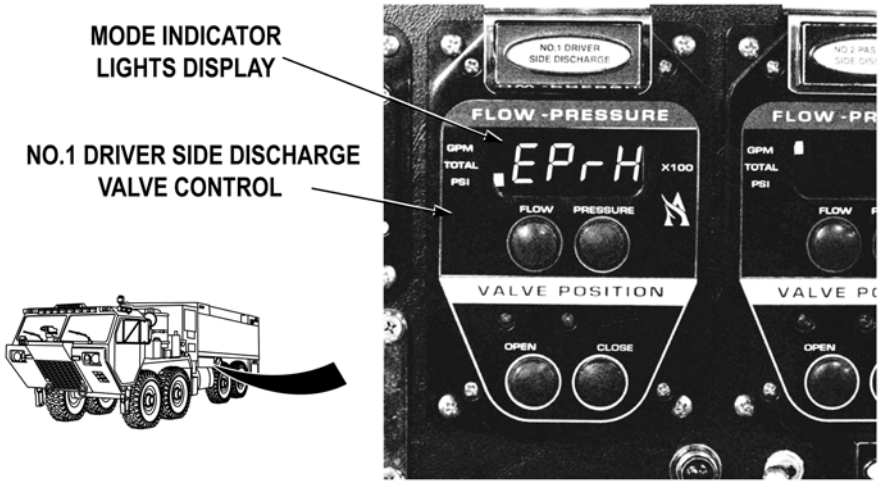
If No. 1 driver side discharge valve worm gear shaft moves excessively after valve is fully open and closed, remove and reinstall No. 1 driver side discharge valve motor (WP 0247), ensuring all mounting hardware is secure.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Push pump operator's panel NO. 1 DRIVER SIDE DISCHARGE valve control PRESSURE button. Check if dEAd error is in mode indicator lights display.

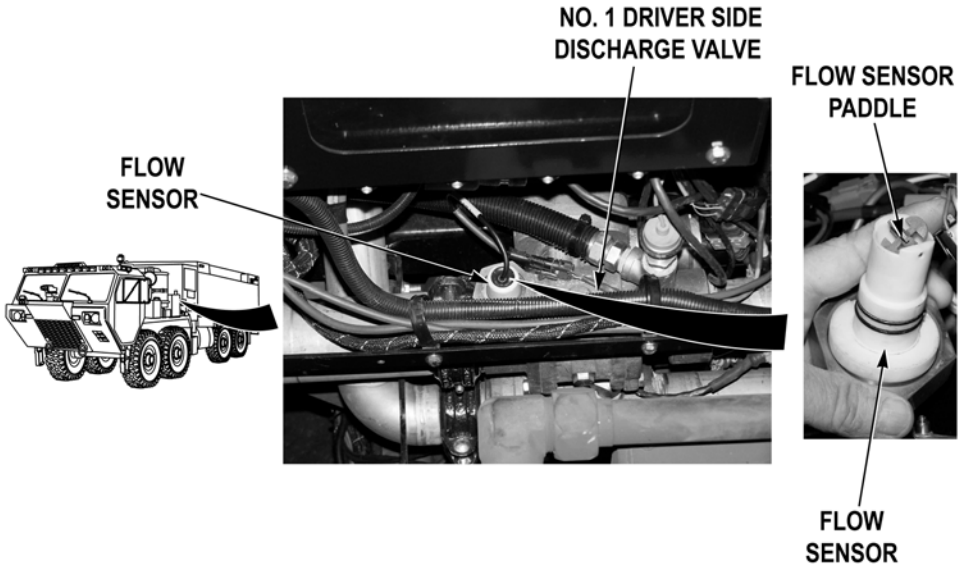
If dEAd error message is displayed, replace NO. 1 DRIVER SIDE DISCHARGE valve control (WP 0208).



Step 6. Check if EPrL or EPrH error is indicated in No. 1 DRIVER SIDE DISCHARGE mode indicator lights display.

If EPrL or EPrH error message is displayed, go to Step 15.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 7. Remove No. 1 driver side discharge valve flow sensor (WP 0249). Do not disconnect wires from sensor. Press pump operator's panel NO. 1 DRIVER SIDE DISCHARGE valve control FLOW button. While an assistant spins flow sensor paddle, check if a flow reading is displayed when flow sensor paddle is spinning.

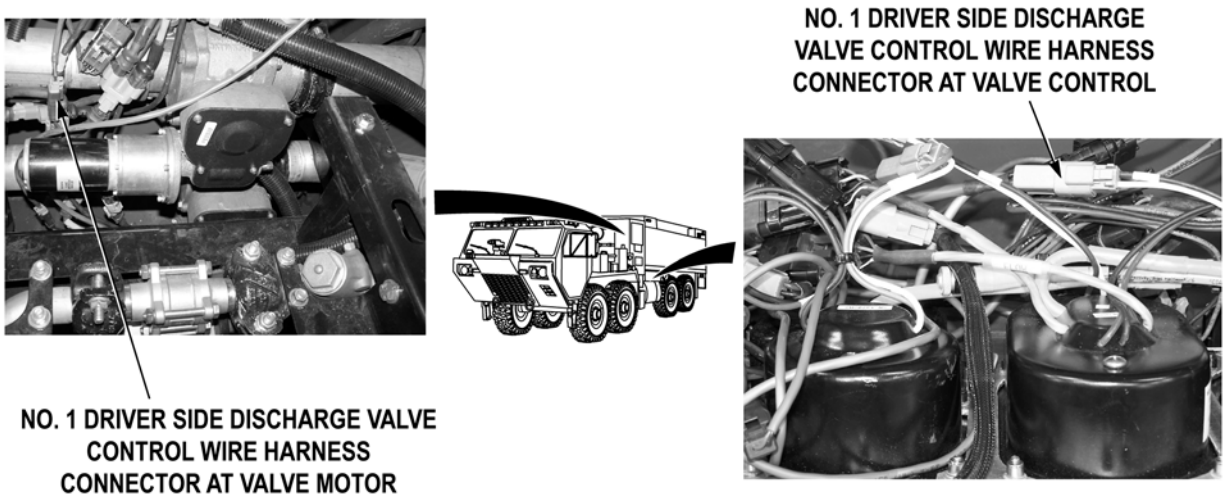
If a reading of 0 gpm (0 lpm) is displayed when the flow sensor paddle is spinning, go to Step 16.

Step 8. Install No. 1 driver side discharge valve flow sensor (WP 0249). Remove No. 1 driver side discharge valve (WP 0316) and inspect it for damage and contamination.

a. If No. 1 driver side discharge valve is free from damage and contamination, reinstall valve (WP 0316).

b. If No. 1 driver side discharge valve is damaged and/or contaminated, repair (WP 0248) or replace No. 1 driver side discharge valve (WP 0316).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Open pump operator's panel (WP 0205). Check discharge valve control wire harness at NO. 1 DRIVER SIDE DISCHARGE valve control and No. 1 driver side discharge valve motor for loose connections.

If discharge valve control wire harness connectors are loose, reconnect loose connectors (WP 0285).

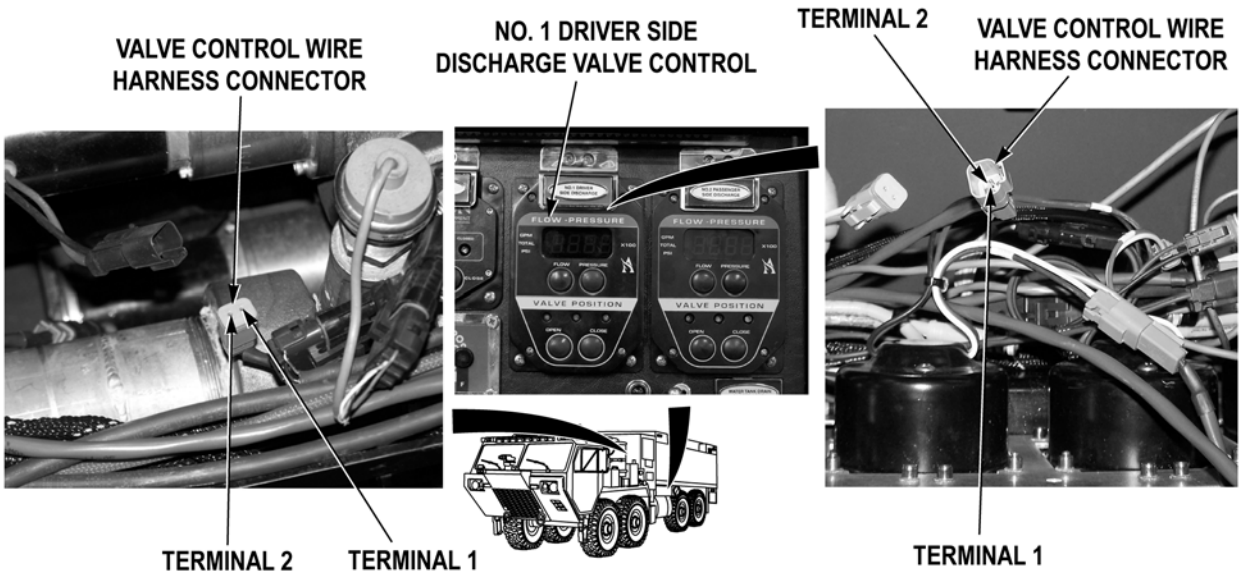
NOTE

- Engine may have to be running to provide enough power to operate valve control. Valve will operate with less voltage, but only yellow indicator light will register on valve control.
- Do not engage PUMP PTO during this procedure. Valve operations can be checked without water pump operation.
- Valve motor operation can be checked by noting vibration of valve assembly, or by observing rotation of 7/16" hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from No. 1 driver side discharge. Water may be released from system when valve is operated.

Step 10. While an assistant pushes pump operator's panel NO. 1 DRIVER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004), check if NO. 1 DRIVER SIDE DISCHARGE valve control yellow indicator light illuminates and No. 1 driver side discharge valve motor operates.

If yellow indicator light illuminates and valve motor operates, replace No. 1 driver side discharge valve drive assembly (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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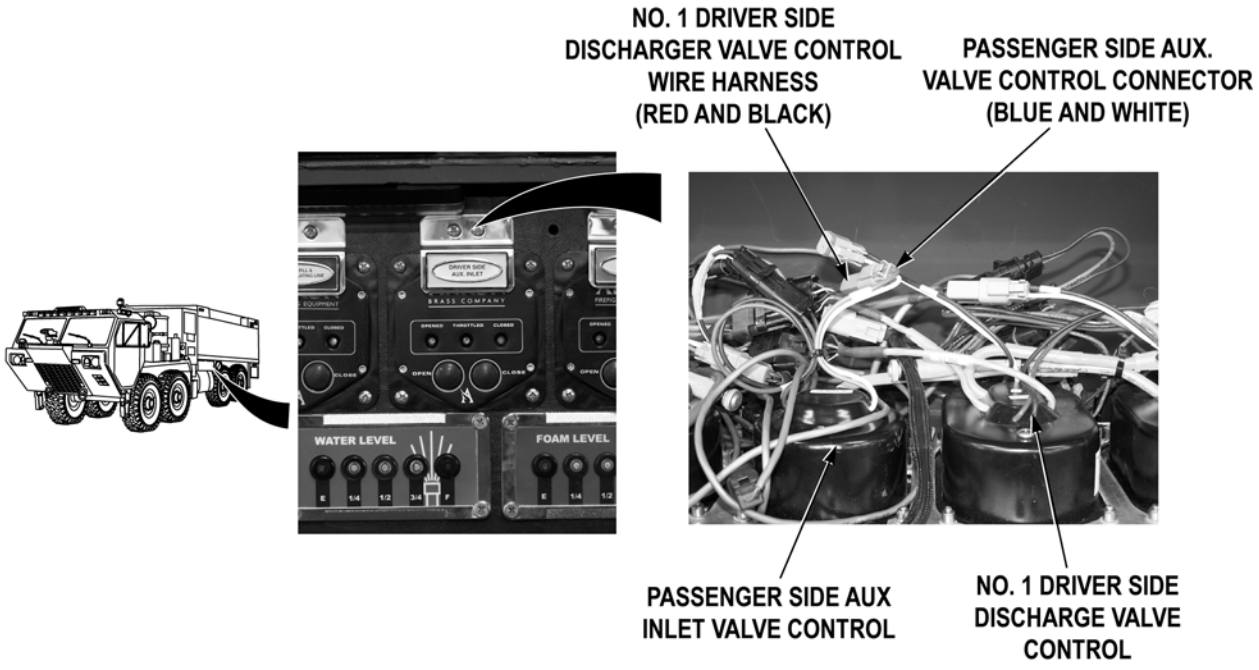
Step 11. Pull battery disconnect switch to off position (WP 0007). Disconnect valve control wire harness connectors from NO. 1 DRIVER SIDE DISCHARGE valve control. Disconnect valve control wire harness connector from No. 1 driver side discharge valve motor. With a test lead set, check for continuity across discharge valve control wire harness from terminal to terminal.

If there is no continuity, repair discharge valve control wire harness if repairable (TM 9-2320-315-14&P), or replace No. 1 driver side discharge valve control wire harness (WP 0285).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

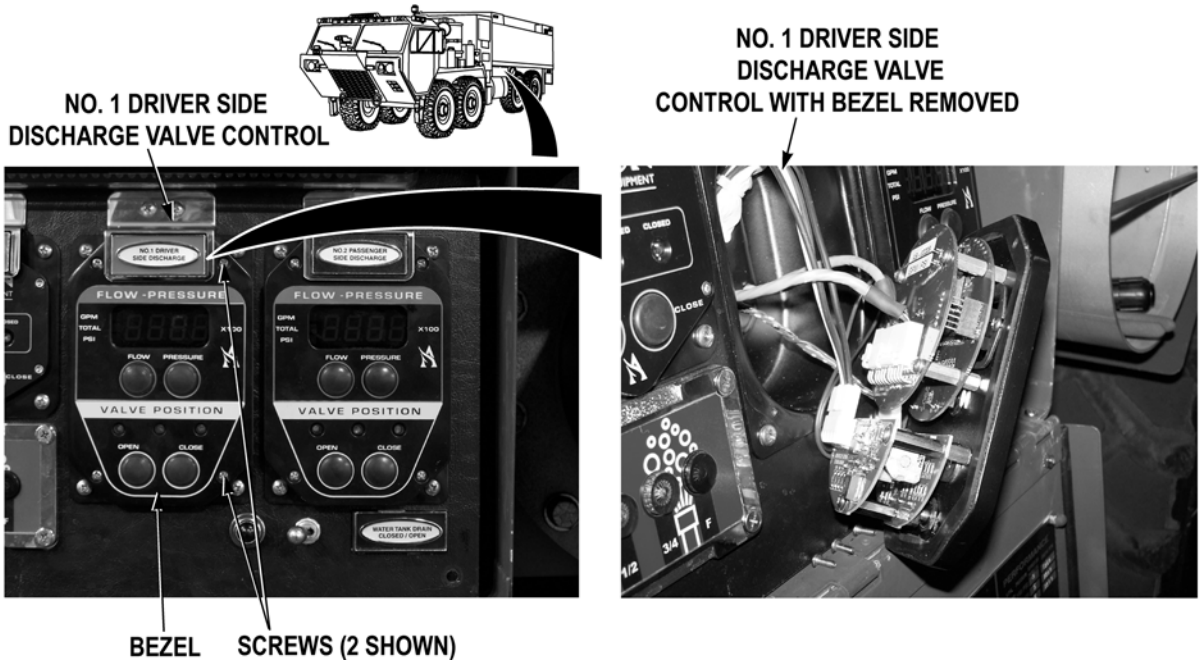


Step 12. Connect valve control wire harness connector to No. 1 driver side discharge valve motor. Disconnect valve control wire harness connector from PASSENGER AUX. INLET valve control. Connect No. 1 driver side discharge valve control wire harness connector to PASSENGER SIDE AUX. INLET valve control. While an assistant pushes pump operator's panel PASSENGER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if No. 1 driver side discharge valve operates.

a. If No. 1 driver side discharge valve operates, reconnect valve control wire harness connectors to original positions and replace NO. 1 DRIVER SIDE DISCHARGE valve control (WP 0208).

b. If No. 1 driver side discharge valve does not operate, reconnect valve control wire harness connectors to original positions and replace No. 1 driver side discharge valve motor (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Remove 4 screws and bezel from pump operator's panel NO. 1 DRIVER SIDE DISCHARGE valve control. Check for signs of water and moisture damage.

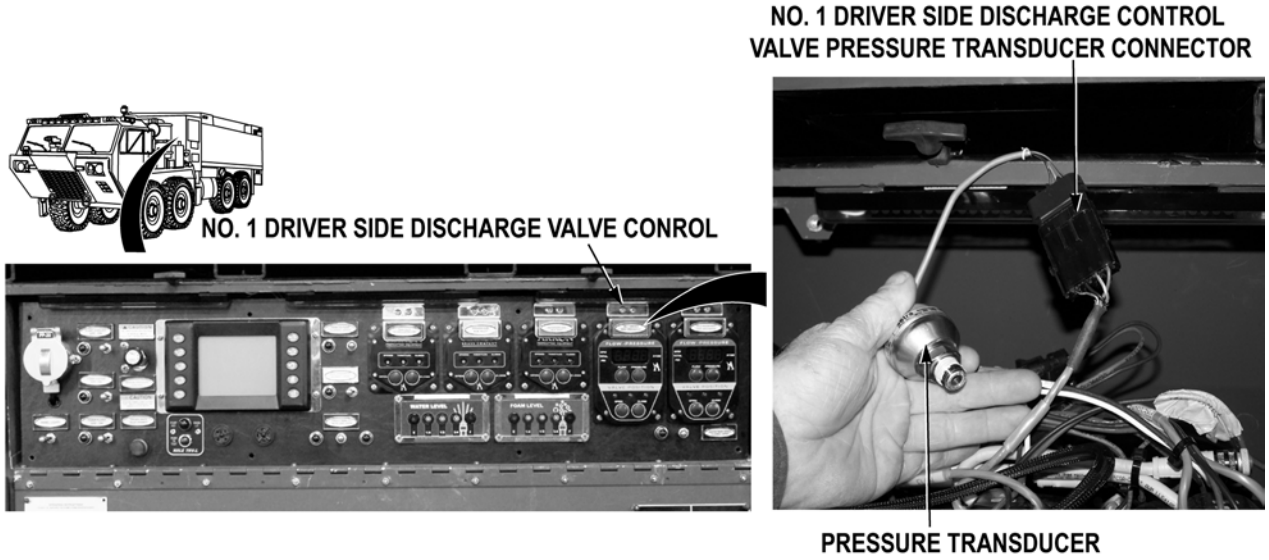
If valve control shows evidence of water and moisture damage, replace NO. 1 DRIVER SIDE DISCHARGE valve control (WP 0208).

Step 14. Install 4 screws and bezel on NO. 1 DRIVER SIDE DISCHARGE valve control. Remove No. 1 driver side discharge valve (WP 0316) and inspect it for binding, damage, and contamination.

a. If No. 1 driver side discharge valve is free from binding, damage, and contamination, reinstall valve (WP 0316) and replace No. 1 driver side discharge valve motor and drive assembly (WP 0247).

b. If No. 1 driver side discharge valve is not free from binding, damage, and contamination, repair (WP 0248) or replace No. 1 driver side discharge valve (WP 0316).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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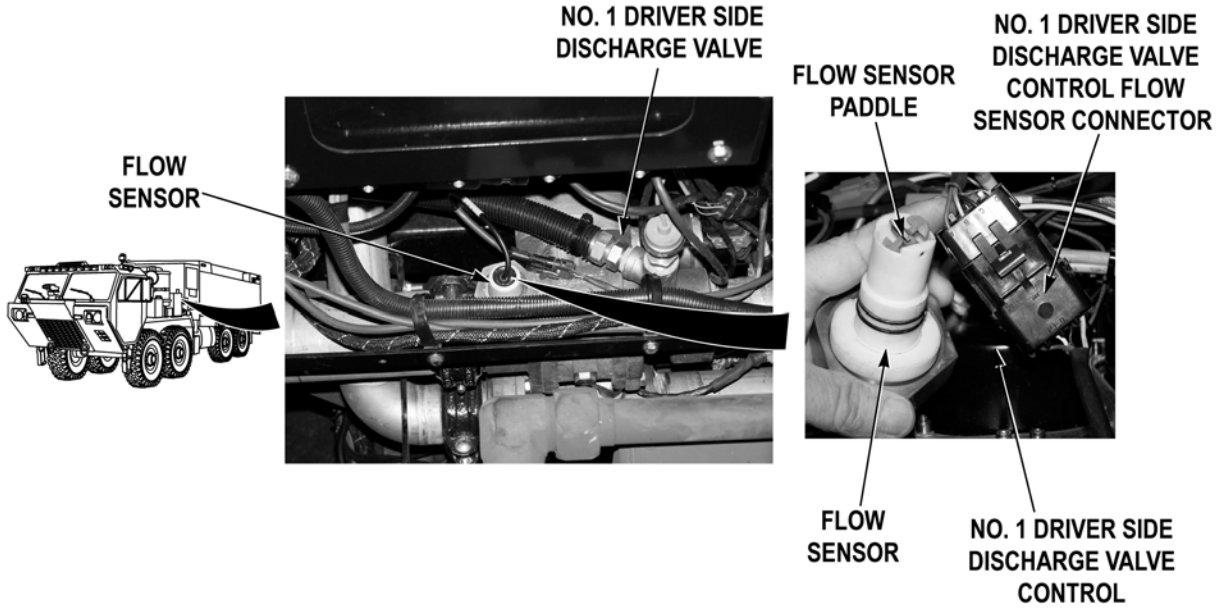
Step 15. Remove pump house panel E (WP 0341). Open pump operator's panel (WP 0205). Remove No. 1 driver side discharge valve pressure transducer (WP 0244). Connect pressure transducer to NO. 1 DRIVER SIDE DISCHARGE valve control (removing pressure transducer wire harness from circuit). Check if error message EPrL or EPrH is displayed.

a. If EPrL or EPrH error message is displayed, replace No. 1 driver side discharge valve pressure transducer (WP 0244).

b. If EPrL or EPrH error message is not displayed, repair pressure transducer wire harness if repairable (TM 9-2320-315-14&P), or replace No. 1 driver side discharge pressure transducer wire harness (WP 0294).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

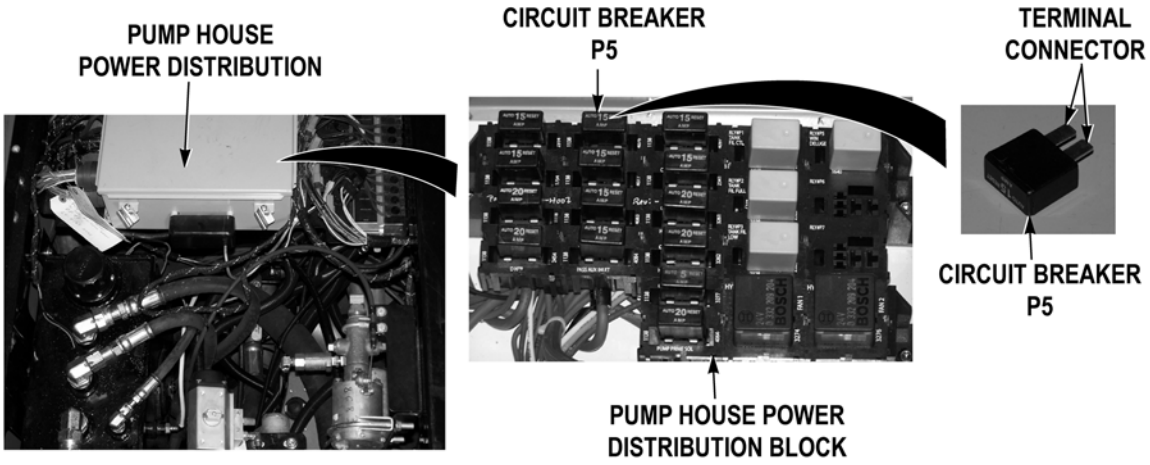


Step 16. Disconnect No. 1 driver side discharge flow sensor (WP 0249) and connect it directly to NO. 1 DRIVER DISCHARGE valve control (removing flow sensor wire harness from circuit). While an assistant spins flow sensor paddle wheel, check if a flow reading is displayed when the flow sensor paddle is spinning.

a. If a flow reading is displayed when flow sensor paddle is spinning, repair flow sensor wire harness if repairable (TM 9-2320-315-14&P), or replace No. 1 driver side discharge flow sensor wire harness (WP 0295).

b. If a flow reading is not displayed when flow sensor paddle is spinning, replace No. 1 driver side discharge flow sensor (WP 0249).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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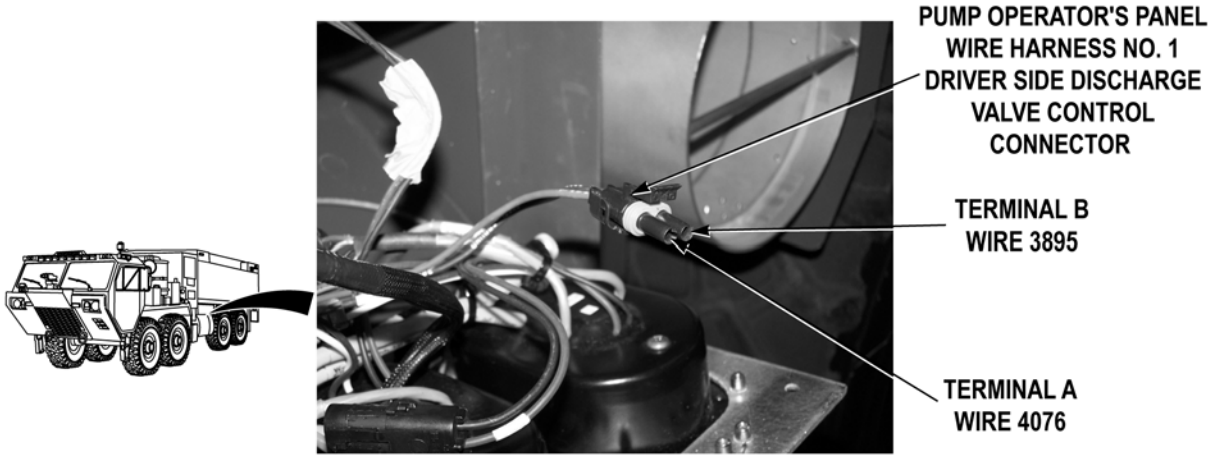
Step 17. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P5 (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P5 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 18. Install circuit breaker P5 (WP 0261). Open pump operator's panel (WP 0205). Disconnect pump house wire harness NO. 1 DRIVER SIDE DISCHARGE VALVE control connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between pump operator's panel wire harness wire 4076 (purple) at NO. 1 DRIVER SIDE DISCHARGE valve control connector, terminal A and a known good ground.

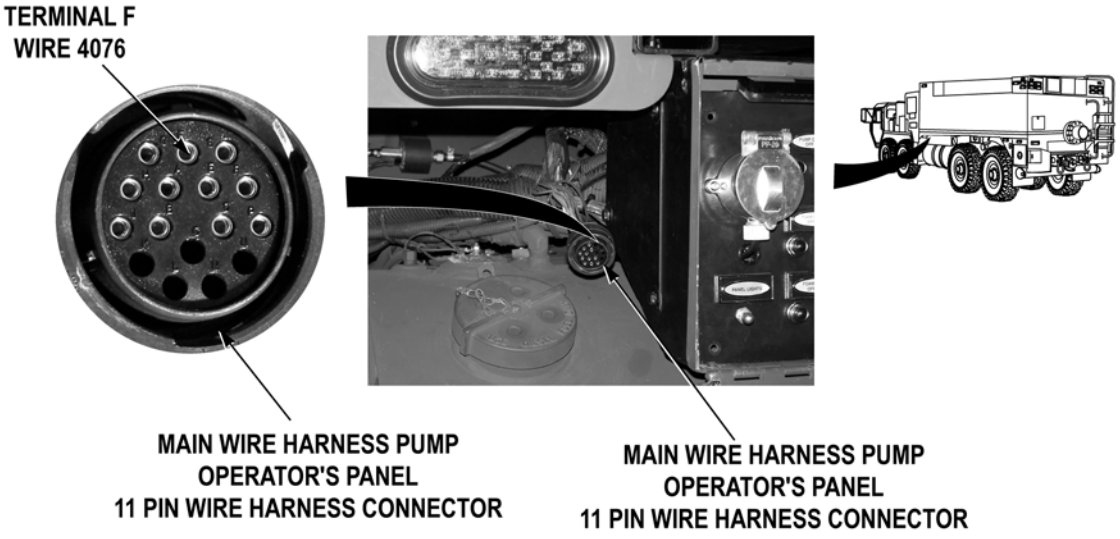
If 22 to 28 VDC are not present, go to Step 20.

Step 19. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 3895 (black) from pump operator's panel NO. 1 DRIVER SIDE DISCHARGE valve control connector, terminal B and a known good ground.

a. If there is continuity, replace NO. 1 DRIVER SIDE DISCHARGE valve control (WP 0208).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

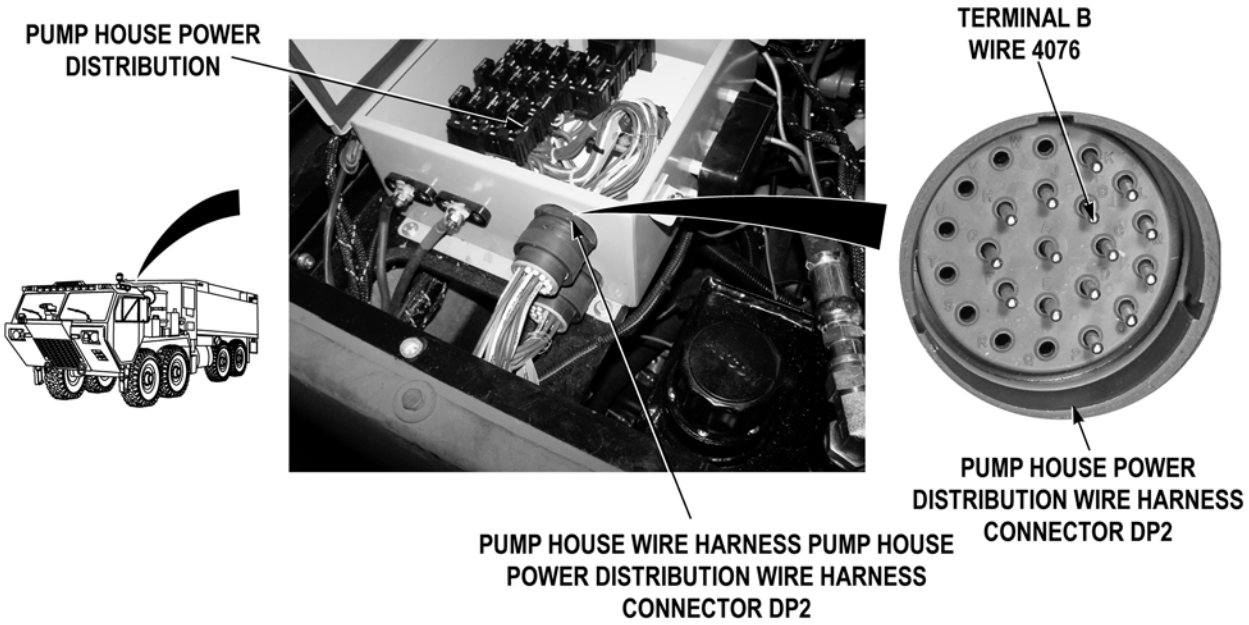
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 20. Disconnect main wire harness pump operator’s panel 11 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 4076 (purple) at main wire harness pump operator’s panel 11 pin wire harness connector, terminal F and a known good ground.

If 22 to 28 VDC are present, repair wire 4076 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 21. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 4076 (purple) at connector DP2, terminal B and a known good ground.

a. If 22 to 28 VDC are present, repair wire 4076 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0293).

b. If 22 to 28 VDC are not present, repair wire 4076 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

NO. 2 PASSENGER SIDE DISCHARGE VALVE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

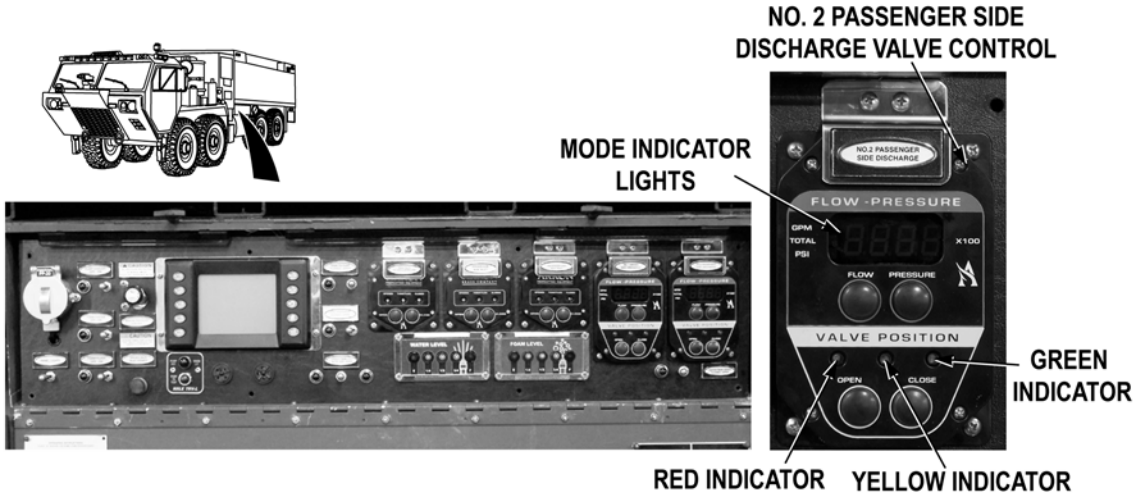
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0205
WP 0208
WP 0244
WP 0247
WP 0248
WP 0249
WP 0261
WP 0285
WP 0293
WP 0296
WP 0298
WP 0300
WP 0304
WP 0316
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NO. 2 PASSENGER SIDE DISCHARGE VALVE DOES NOT OPERATE PROPERLY

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



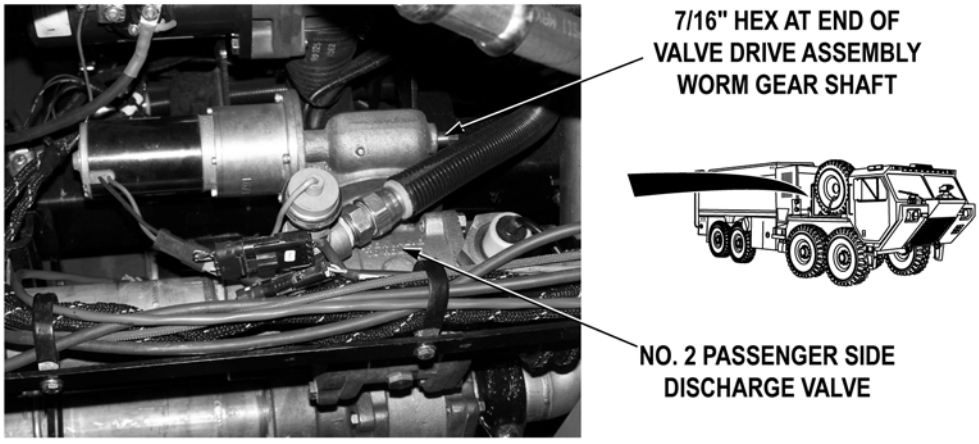
NOTE

Ensure batteries are fully charged before performing Step 1.

Step 1. Push battery disconnect switch to on position (WP 0007). Check if pump operator's panel NO. 2 PASSENGER SIDE DISCHARGE valve control display illuminates.

If display is not illuminated, go to Step 17.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



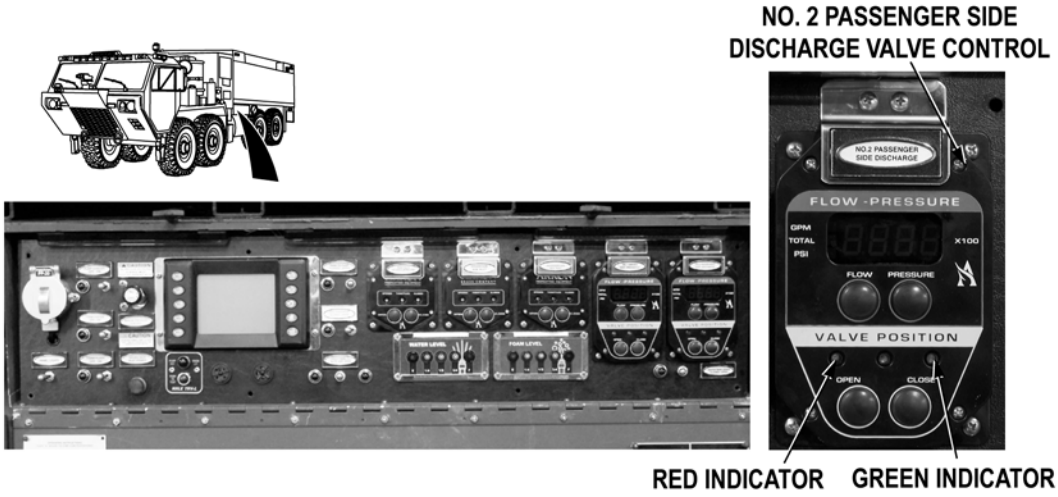
NOTE

- Valve operation can be checked by noting vibration of valve assembly or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from NO. 2 PASSENGER SIDE DISCHARGE. Water may be released from system when valve is operated.

Step 2. Remove pump house panel G (WP 0341). While an assistant pushes pump operator’s panel NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004), check if No. 2 passenger side discharge valve operates to open and close positions.

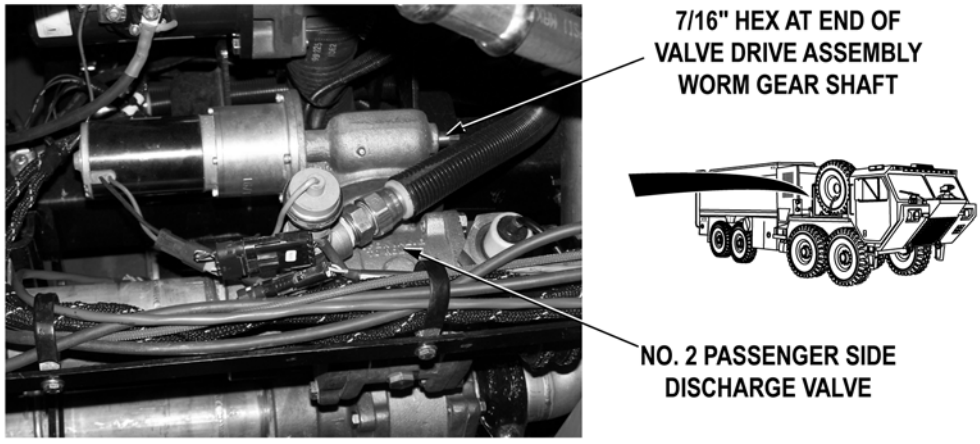
If No. 2 passenger side discharge valve does not open and close, go to Step 9.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. While an assistant monitors operation of No. 2 passenger side discharge valve, push pump operator's panel NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004). Check if NO. 2 PASSENGER SIDE DISCHARGE valve control opened (green) and closed (red) indicators illuminate before No. 2 passenger side discharge valve is fully opened or closed.

If NO. 2 PASSENGER SIDE DISCHARGE valve control indicators illuminate before No. 2 passenger side discharge valve is fully opened or closed, go to Step 13.



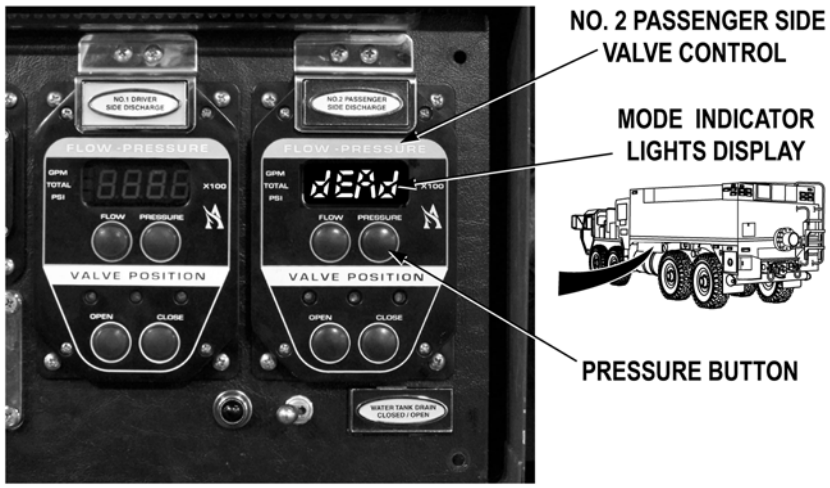
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NOTE

Valve operation must be checked by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft for Step 4.

Step 4. While an assistant pushes pump operator’s panel NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004), check if No. 2 passenger side discharge valve worm gear shaft moves excessively after valve is fully opened or closed.

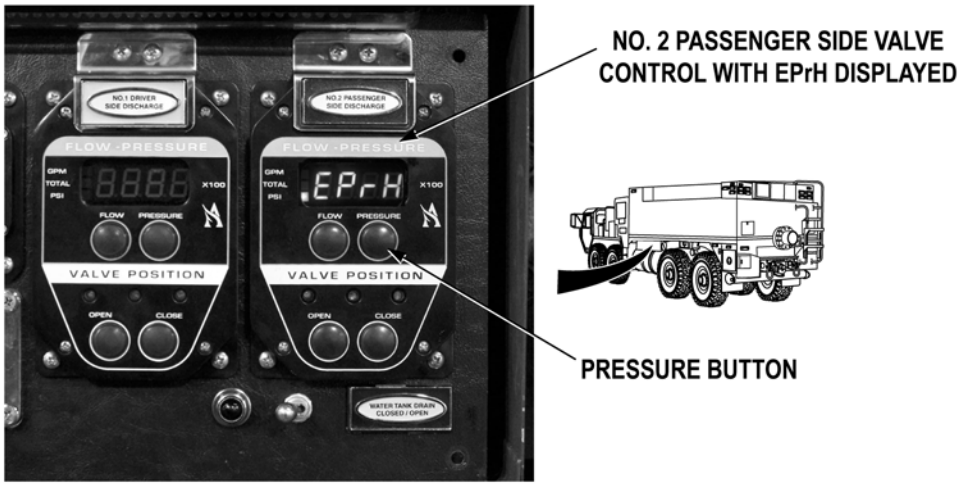
If No. 2 passenger side discharge valve worm gear shaft moves excessively after valve is fully opened or closed, remove and re-install No. 2 passenger side discharge valve motor (WP 0247), ensuring all mounting hardware is secure.



Step 5. Push pump operator’s panel NO. 2 PASSENGER SIDE DISCHARGE valve control PRESSURE button. Check if dEAd error is indicated in mode indicator lights display.

If dEAd error message is displayed, replace NO. 2 PASSENGER SIDE DISCHARGE valve control (WP 0208).

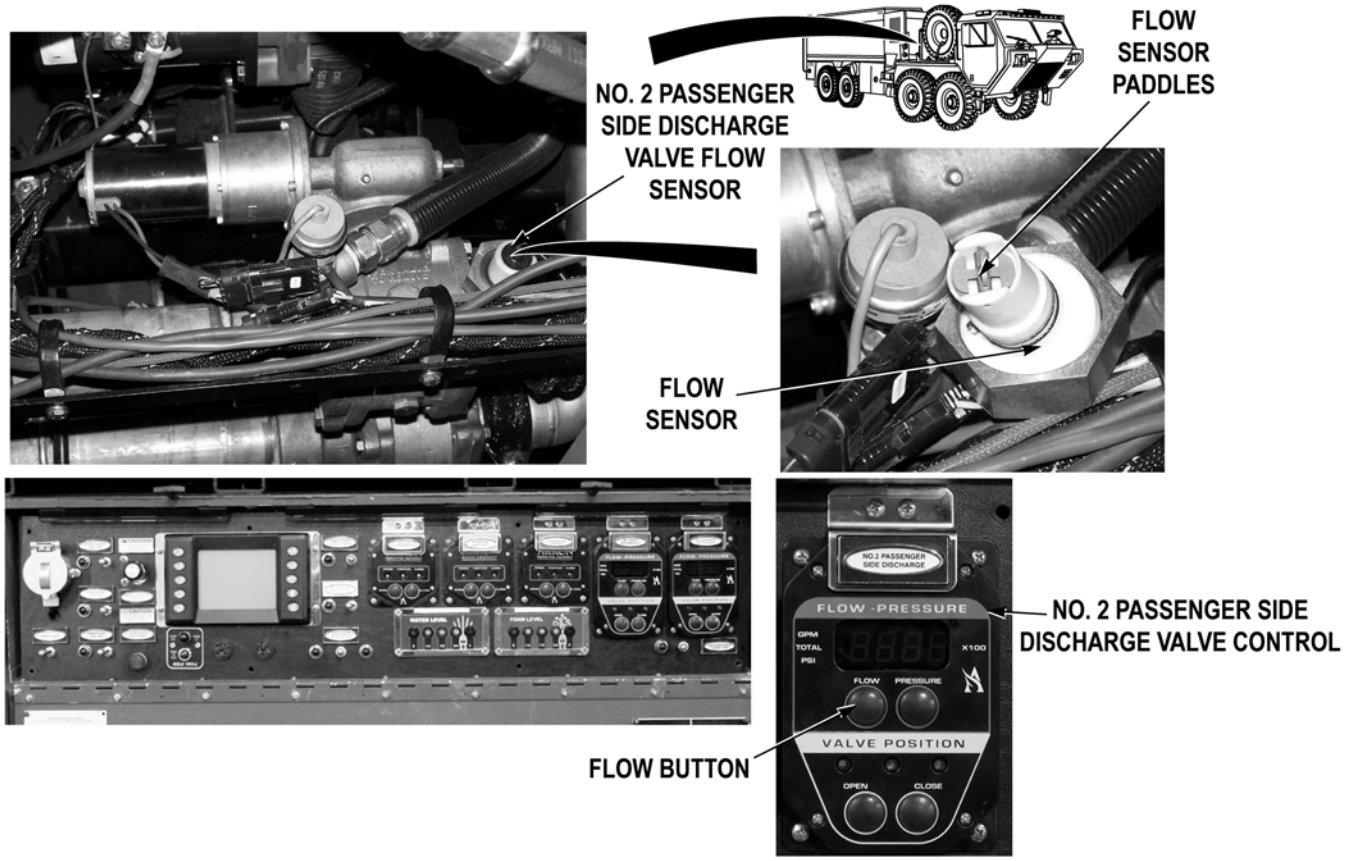
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Check if EPrL or EPrH error is indicated in mode indicator lights display.

If EPrL or EPrH error message is displayed, go to Step 15.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



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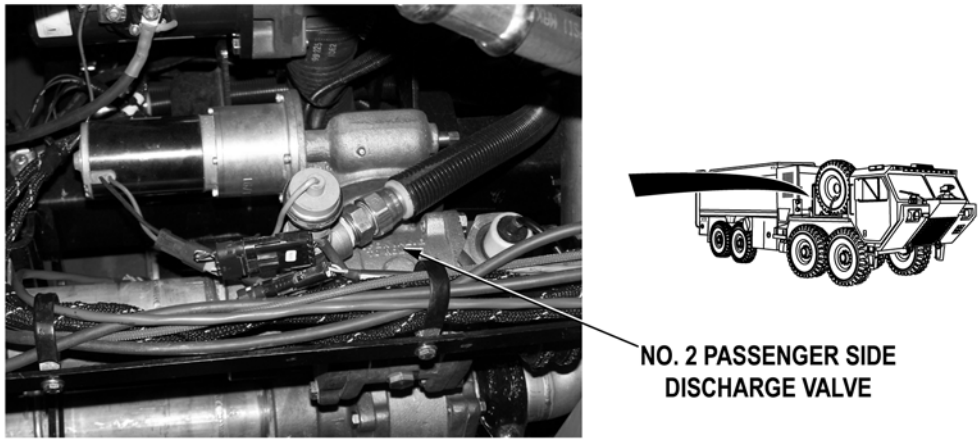
Step 7. Remove No. 2 passenger side discharge valve flow sensor (WP 0249). Do not disconnect wires from sensor. Push pump operator's panel NO. 2 PASSENGER SIDE DISCHARGE valve control FLOW button. While an assistant spins flow sensor paddle, check if a flow reading is displayed when flow sensor paddle is spinning.

If a reading of 0 gpm (0 lpm) is displayed when flow sensor paddle is spinning, go to Step 16.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

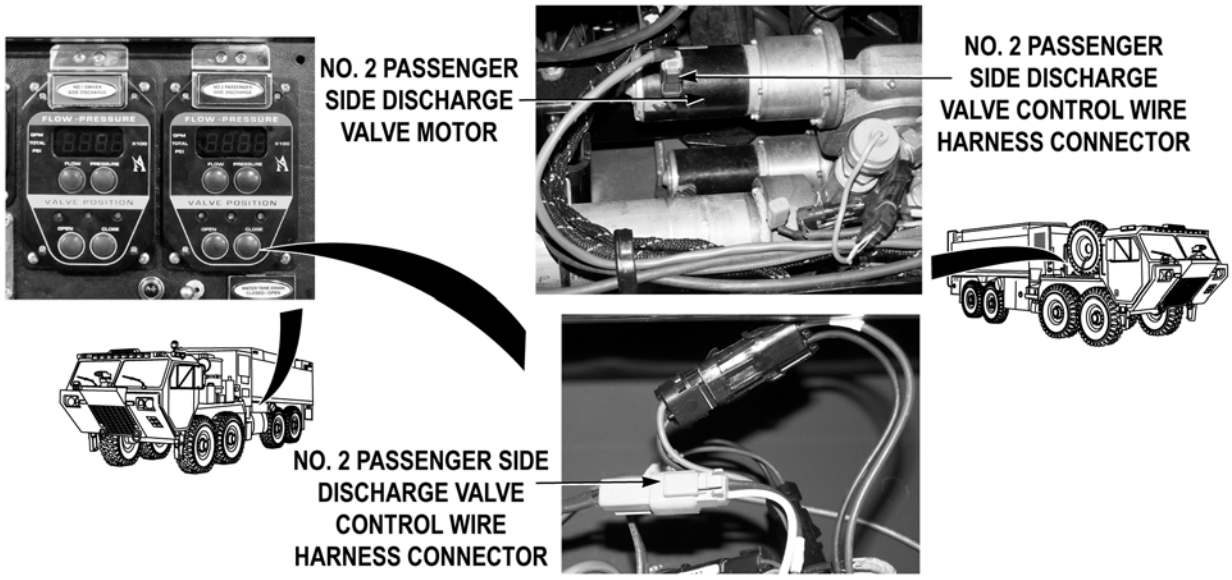


Step 8. Install No. 2 passenger side discharge valve flow sensor (WP 0249). Remove No. 2 passenger side discharge valve (WP 0316) and inspect it for damage and contamination.

a. If No. 2 passenger side discharge valve is free from damage and contamination, reinstall valve (WP 0316) and go to Step 9.

b. If No. 2 passenger side discharge valve is damaged and/or contaminated, repair (WP 0248) or replace No. 2 passenger side discharge valve (WP 0316).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Open pump operator's panel (WP 0205). Check No. 2 passenger side discharge valve control wire harness at NO. 2 PASSENGER SIDE DISCHARGE valve control and No. 2 passenger side discharge valve motor for loose connections.

If No. 2 passenger side discharge valve control wire harness connectors are loose, reconnect loose connectors (WP 0285).

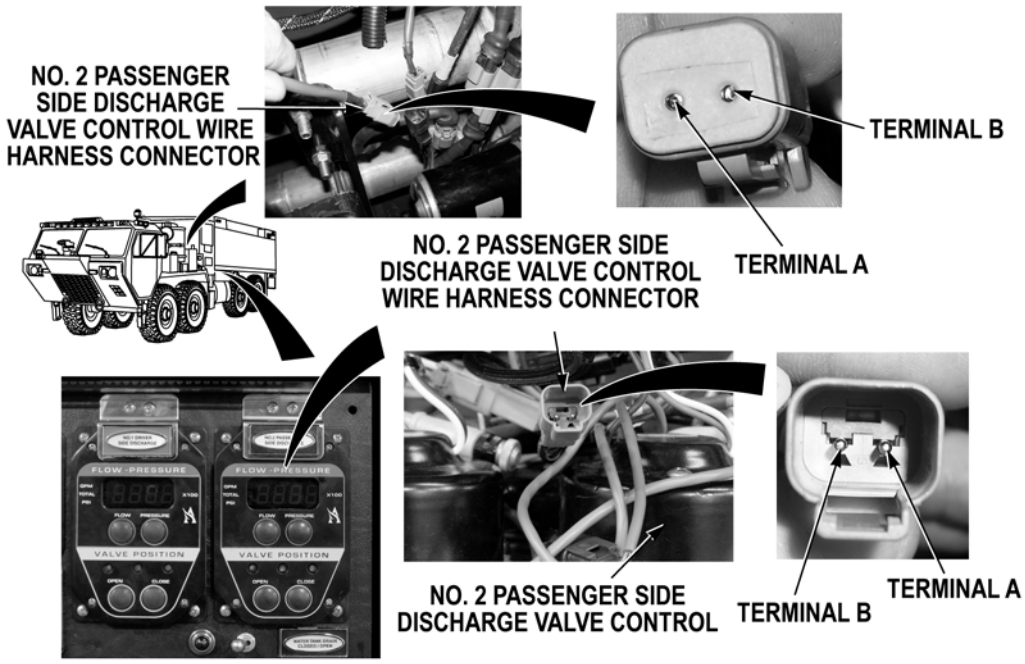
NOTE

- Engine may have to be running to provide enough power to operate valve control. Valve will operate with less voltage, but only yellow indicator light will register on valve control.
- Do not engage PUMP PTO during this procedure. Valve operations can be checked without water pump operation.
- Valve motor operation can be checked by noting vibration of valve assembly, or by observing rotation of 7/16" hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from NO. 1 DRIVER SIDE DISCHARGE. Water may be released from system when valve is operated.

Step 10. While an assistant pushes pump operator's panel NO. 2 PASSENGER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004), check if NO. 2 PASSENGER SIDE DISCHARGE valve control yellow indicator illuminates and No. 2 passenger side discharge valve motor operates.

If indicator illuminates and valve motor operates, replace No. 2 passenger side discharge valve drive assembly (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



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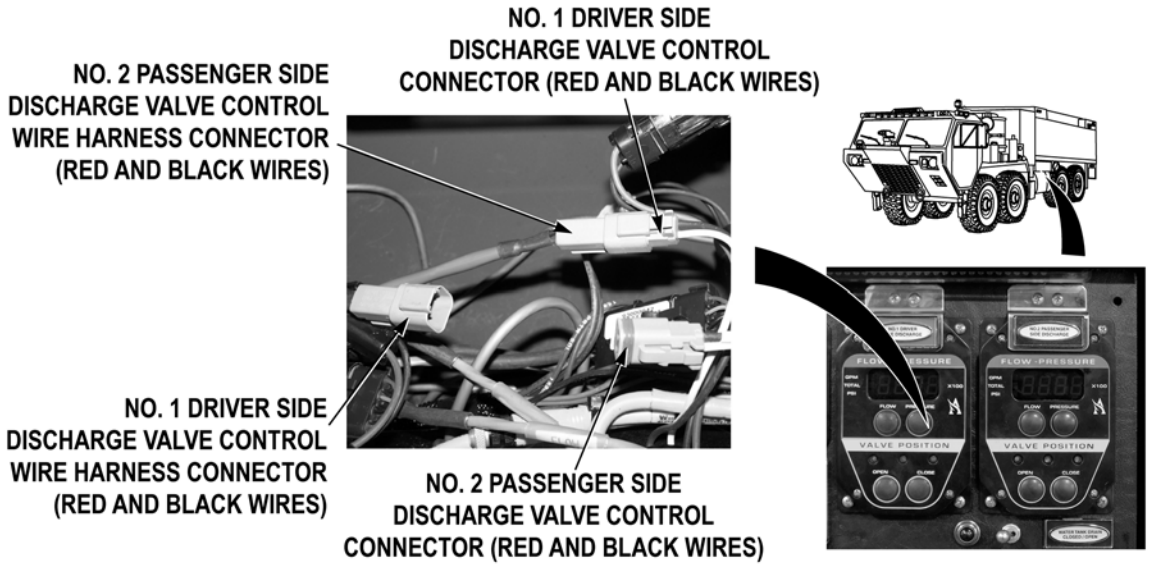
Step 11. Pull battery disconnect switch to off position (WP 0007). Disconnect No. 2 passenger side discharge valve control wire harness connector from NO. 2 PASSENGER SIDE DISCHARGE valve control. Disconnect No. 2 passenger side discharge valve control wire harness connector from No. 2 passenger side discharge valve motor. With a test lead set, check for continuity across discharge valve control wire harness from terminal to terminal.

If there is no continuity, repair No. 2 passenger side discharge valve control wire harness if repairable (TM 9-2320-315-14&P), or replace No. 2 passenger side discharge valve control wire harness (WP 0285).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

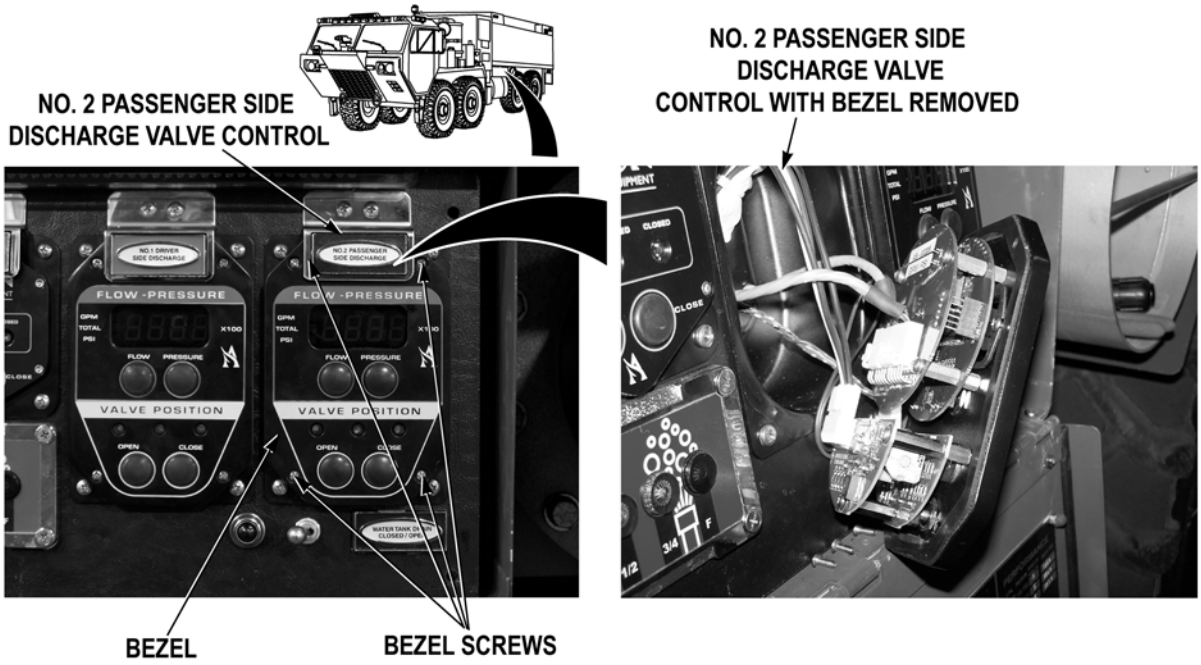


Step 12. Connect No. 2 passenger side discharge valve control wire harness connector to No. 2 passenger side discharge valve motor. Disconnect No. 1 driver side discharge valve control wire harness connector from NO. 1 DRIVER SIDE DISCHARGE valve control. Connect No. 2 passenger side discharge valve control wire harness connector to NO. 1 DRIVER SIDE DISCHARGE valve control. While an assistant pushes pump operator's panel NO. 1 DRIVER SIDE DISCHARGE valve control OPEN and CLOSE buttons (WP 0004), check if No. 2 passenger side discharge valve operates.

a. If No. 2 passenger side discharge valve operates, reconnect valve control wire harness connectors to original positions and replace NO. 2 PASSENGER SIDE DISCHARGE valve control (WP 0208).

b. If No. 2 passenger side discharge valve does not operate, reconnect valve control wire harness connectors to original positions and replace No. 2 passenger side discharge valve motor (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Remove four screws and bezel from pump operator's panel NO. 2 PASSENGER SIDE DISCHARGE valve control. Check for signs of water and moisture damage.

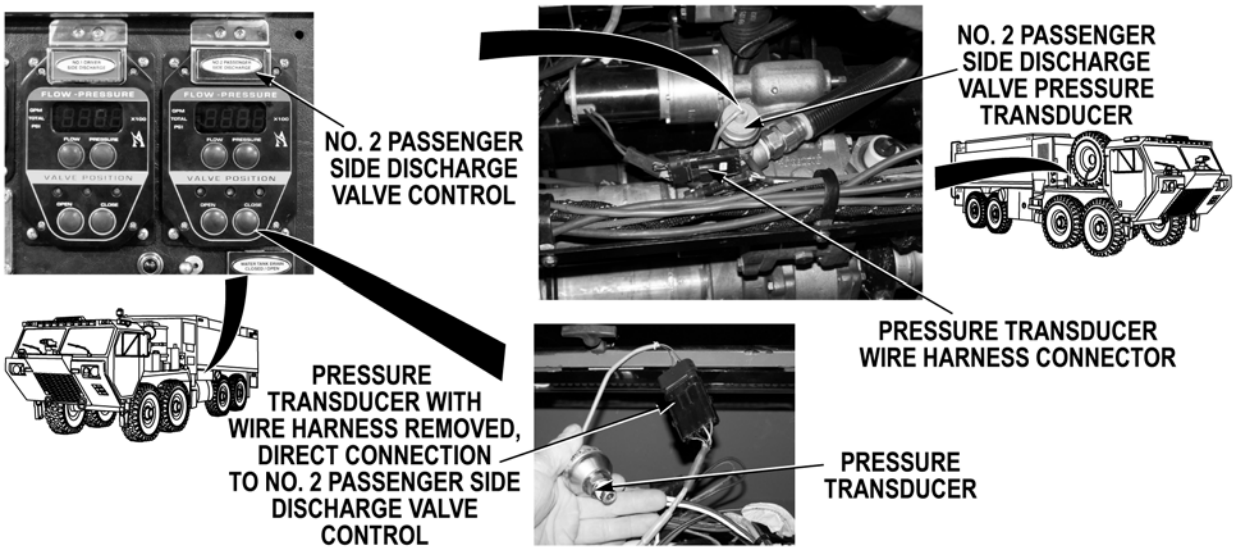
If NO. 2 PASSENGER SIDE DISCHARGE valve control shows evidence of water and moisture damage, replace NO. 2 PASSENGER SIDE DISCHARGE valve control (WP 0208).

Step 14. Install bezel and four screws on NO. 2 PASSENGER SIDE DISCHARGE valve control. Remove No. 2 passenger side discharge valve (WP 0316) and inspect it for binding, damage, and contamination.

a. If No. 2 passenger side discharge valve is free from binding, damage, and contamination, reinstall valve (WP 0316) and replace No. 2 passenger side discharge valve motor and drive assembly (WP 0247).

b. If No. 2 passenger side discharge valve is binding, damaged, and/or contaminated, repair (WP 0248) or replace No. 2 passenger side discharge valve (WP 0316).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 15. Remove No. 2 passenger side discharge valve pressure transducer (WP 0244). Disconnect No. 2 passenger side discharge valve pressure transducer wire harness from NO. 2 PASSENGER SIDE DISCHARGE valve control. Connect pressure transducer to NO. 2 PASSENGER DISCHARGE valve control (removing wire harness from circuit). Check if error message EPrL or EPrH is displayed.

a. If EPrL or EPrH error message is displayed, replace No. 2 passenger side valve discharge pressure transducer (WP 0244).

b. If EPrL or EPrH error message is not displayed, repair pressure transducer wire harness if repairable (TM 9-2320-315-14&P), or replace No. 2 passenger side discharge valve pressure transducer wire harness (WP 0296).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

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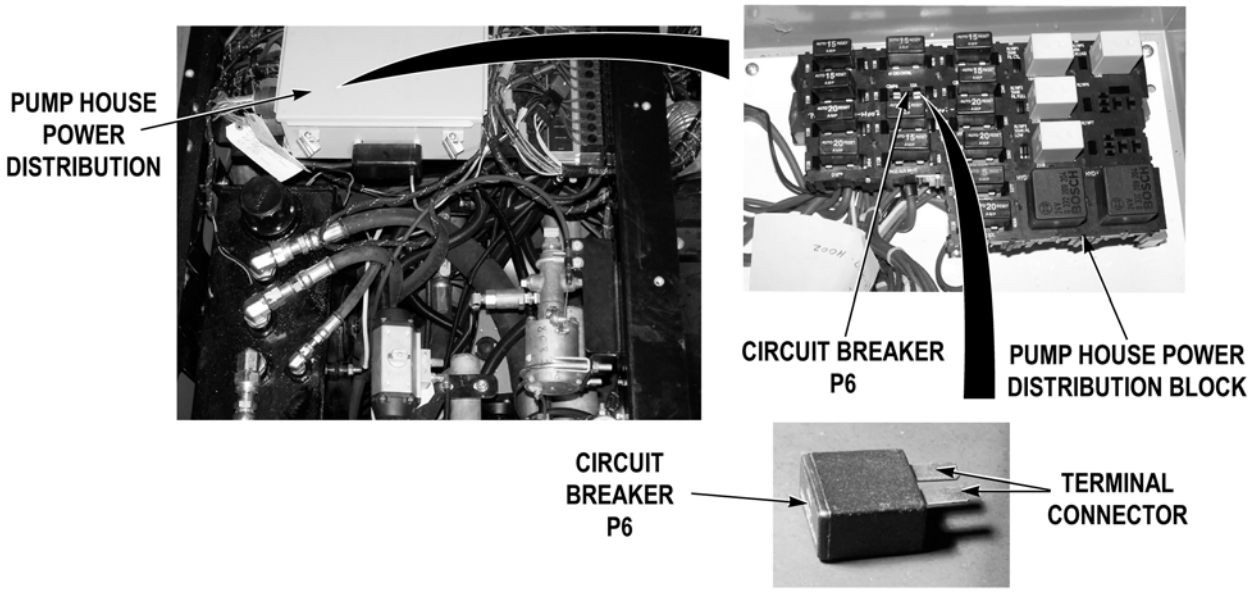
Step 16. Disconnect No. 2 passenger side discharge valve flow sensor wire harness from No. 2 passenger side discharge flow sensor. Disconnect No. 2 passenger side discharge valve flow sensor wire harness from NO. 2 PASSENGER DISCHARGE valve control. Connect No. 2 passenger side discharge flow sensor to NO. 2 PASSENGER DISCHARGE valve control (removing wire harness from circuit). While an assistant spins flow sensor paddle wheel, check if a flow reading is displayed when flow sensor paddle is spinning.

a. If a flow reading is displayed when flow sensor paddle is spinning, repair flow sensor wire harness if repairable (TM 9-2320-315-14&P), or replace No. 2 passenger side discharge valve flow sensor wire harness (WP 0298).

b. If a flow reading is not displayed when flow sensor paddle is spinning, replace No. 2 passenger side discharge valve flow sensor (WP 0249).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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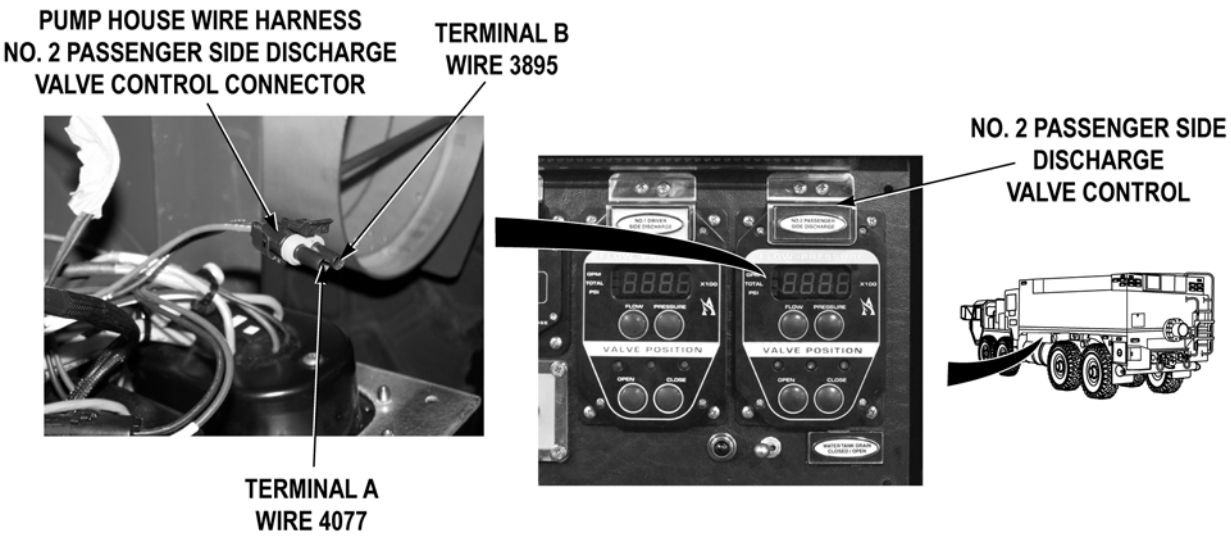
Step 17. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P6 (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P6 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Install circuit breaker P6 (WP 0261). Open pump operator's panel (WP 0205). Disconnect pump house wire harness NO. 2 PASSENGER SIDE DISCHARGE valve control connector. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump operator's panel wire harness wire 4077 (blue) at NO. 2 PASSENGER SIDE DISCHARGE valve control connector, terminal A and a known good ground.

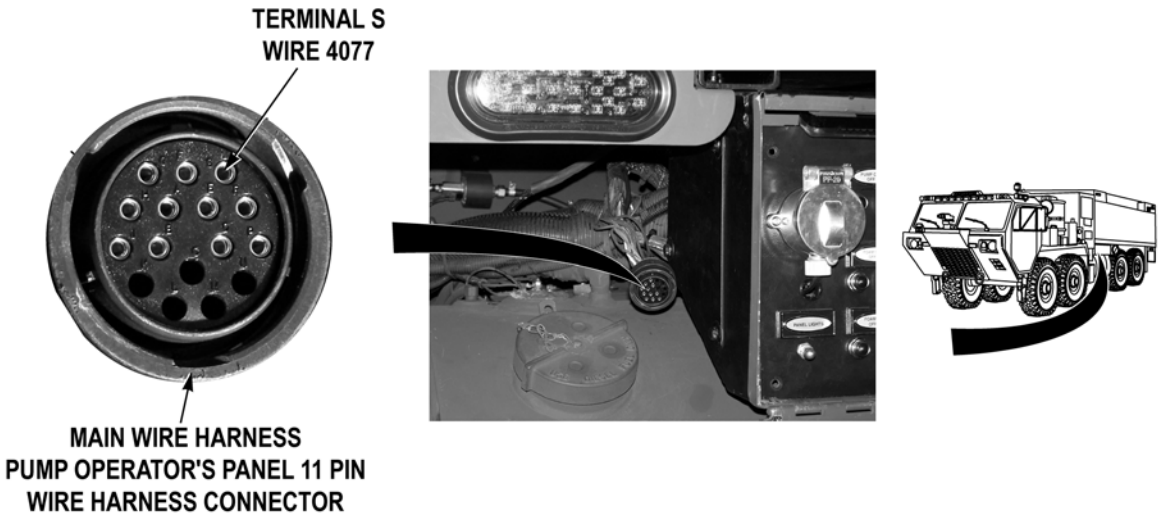
If 22 to 28 VDC are not present, go to Step 20.

Step 19. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 3895 (black) from pump operator's panel NO. 2 PASSENGER SIDE DISCHARGE valve control connector, terminal B and a known good ground.

a. If there is continuity, replace No. 2 PASSENGER SIDE DISCHARGE valve control (WP 0208).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 20. Disconnect main wire harness pump operator’s panel 11 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 4077 (blue) at main wire harness pump operator’s panel 11 pin wire harness connector, terminal S and a known good ground.

If 22 to 28 VDC are present, repair wire 4077 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 21. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 4077 (blue) at connector DP2, terminal C and a known good ground.

a. If 22 to 28 VDC are present, repair wire 4077 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0293).

b. If 22 to 28 VDC are not present, repair wire 4077 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PASSENGER SIDE AUXILIARY INLET VALVE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

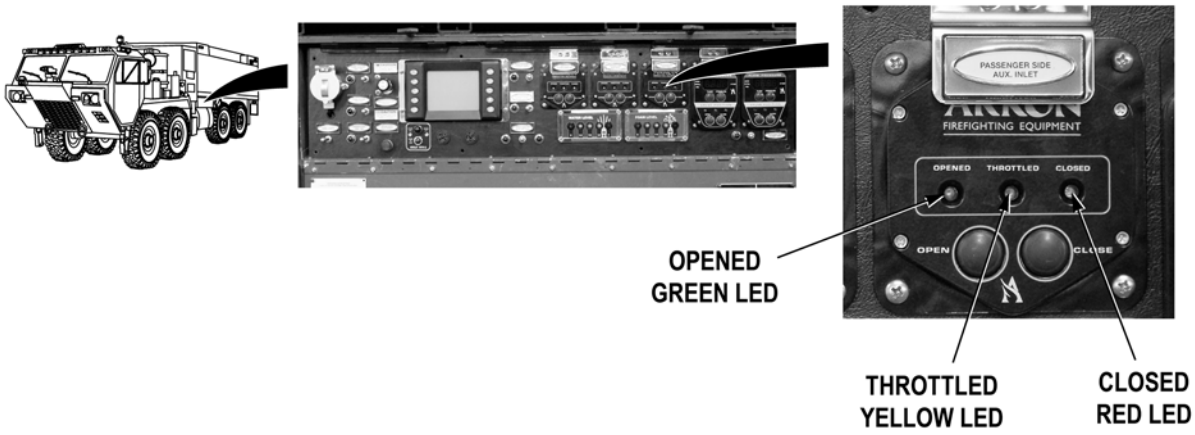
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0184
WP 0205

References (continued)
WP 0207
WP 0247
WP 0248
WP 0261
WP 0286
WP 0300
WP 0303
WP 0304
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PASSENGER SIDE AUXILIARY INLET VALVE DOES NOT OPERATE PROPERLY



NOTE

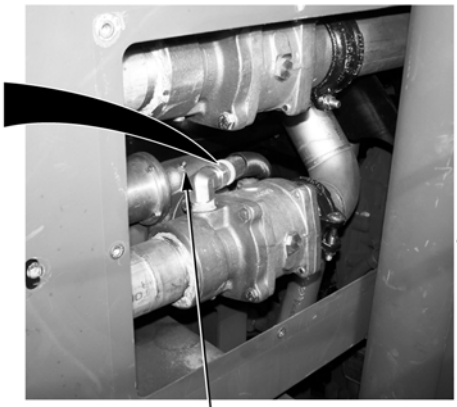
Ensure batteries are fully charged before performing Step 1.

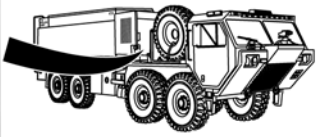
Step 1. Push battery disconnect switch to on position (WP 0007). Check if pump operator's panel PASSENGER SIDE AUX. INLET valve control display illuminates.

If display is not illuminated, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

7/16" HEX AT END OF VALVE
DRIVE ASSEMBLY WORM GEAR SHAFT





PASSENGER SIDE AUXILIARY INLET VALVE

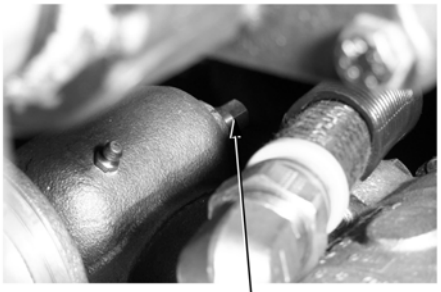
NOTE

- Valve operation can be checked either by noting vibration of valve assembly, or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from PASSENGER SIDE AUX. INLET. Water may be released from system when valve is operated.

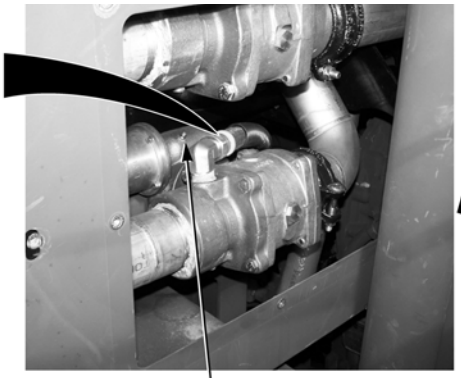
Step 2. Remove pump house panel F (WP 0341). While an assistant pushes pump operator’s panel PASSENGER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if passenger side auxiliary inlet valve operates.

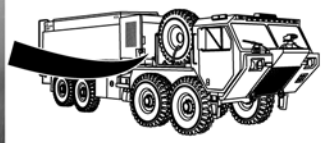
If passenger side auxiliary inlet valve does not open and close, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



7/16" HEX AT END OF VALVE
DRIVE ASSEMBLY WORM GEAR SHAFT





PASSENGER SIDE AUXILIARY INLET VALVE

NOTE

PASSENGER SIDE AUX. INLET valve control will indicate 'THROTTLED' with a yellow LED while valve is partially opened or closed.

Step 3. While an assistant pushes pump operator's panel PASSENGER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004). Check if PASSENGER SIDE AUX. INLET valve control OPENED (green) and CLOSED (red) indicators illuminate before the valve is fully opened or closed.

If PASSENGER SIDE AUX. INLET valve control indicators illuminate before the valve is fully opened or closed, go to Step 6.

NOTE

Valve operations must be checked by observing rotation of 7/16" hex at end of valve drive assembly worm gear shaft for Step 4.

Step 4. While an assistant pushes pump operator's panel PASSENGER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if passenger side auxiliary inlet valve worm gear shaft moves after valve is fully opened or closed.

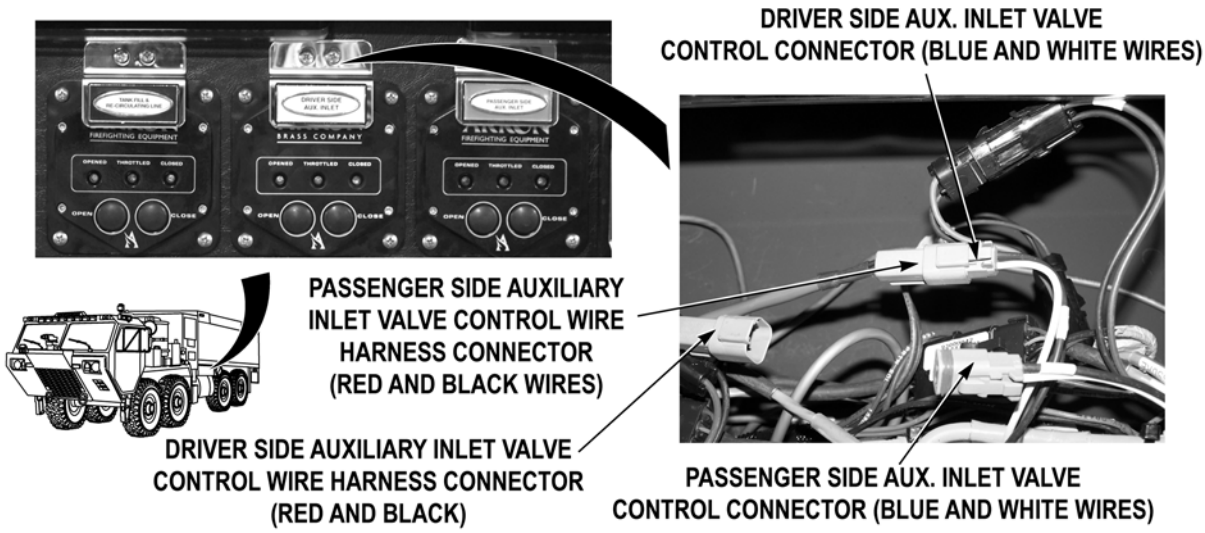
If passenger side auxiliary inlet valve worm gear shaft moves excessively after valve is fully opened or closed, remove and re-install passenger side auxiliary inlet valve motor (WP 0247), ensuring all mounting hardware is secure.

Step 5. Remove passenger side auxiliary inlet valve (WP 0184) and inspect it for damage and contamination.

a. If passenger side auxiliary inlet valve is free from damage and contamination, reinstall valve (WP 0184) and go to Step 6.

b. If passenger side auxiliary inlet valve is damaged and/or contaminated, repair (WP 0248) or replace passenger side auxiliary inlet valve (WP 0184).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 6. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect valve control wire harness connector from PASSENGER SIDE AUX. INLET valve control. Disconnect valve control wire harness connector from DRIVER SIDE AUX. INLET valve control. Connect passenger side auxiliary inlet valve control wire harness connector to DRIVER SIDE AUX. INLET valve control connector. Push battery disconnect switch to on position (WP 0007). While an assistant monitors operation of passenger side auxiliary inlet valve, push pump operator's panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004). Check if DRIVER SIDE AUX. INLET valve control OPENED (green) and CLOSED (red) indicators illuminate before passenger side auxiliary inlet valve is fully opened or closed.

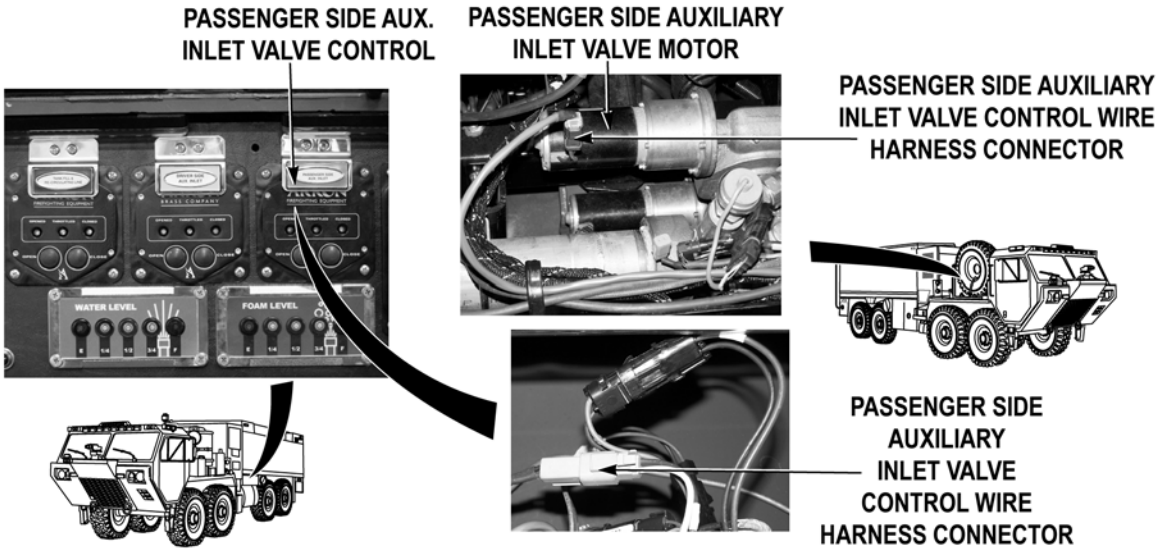
If DRIVER SIDE AUX. INLET valve control indicators do not illuminate before passenger side auxiliary valve is fully opened or closed, reconnect valve control wire harnesses to original positions and replace PASSENGER SIDE AUX. INLET valve control (WP 0207).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 7. Pull battery disconnect switch to off position (WP 0007). Reconnect valve control wire harnesses to original positions. Remove passenger side auxiliary inlet valve (WP 0184) and inspect it for binding, damage, and contamination.

a. If passenger side auxiliary inlet valve is free from binding, damage, and contamination, reinstall valve (WP 0184) and replace passenger side auxiliary inlet valve motor and drive assembly (WP 0247).

b. If passenger side auxiliary inlet valve is not free from binding, damage, and/or contamination, repair (WP 0248) or replace passenger side auxiliary inlet valve (WP 0184).



WARNING

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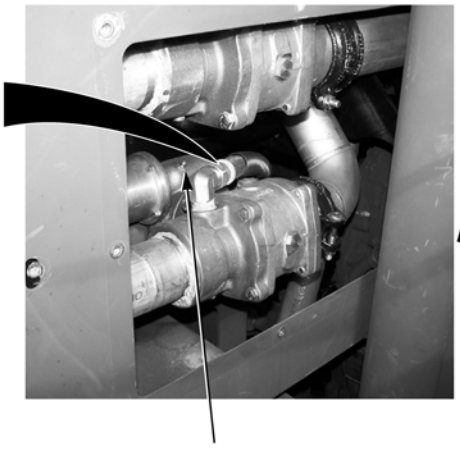
Step 8. Pull battery disconnect to off position (WP 0007). Open pump operator's panel (WP 0205). Check passenger side auxiliary inlet valve control wire harness from PASSENGER SIDE AUX. INLET valve control to passenger side auxiliary inlet valve motor for loose connections.

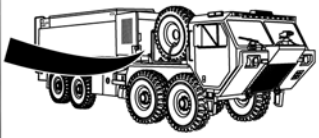
Reconnect loose passenger side auxiliary inlet valve control wire harness connectors (WP 0286).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

7/16" HEX AT END OF VALVE DRIVE ASSEMBLY WORM GEAR SHAFT



PASSENGER SIDE AUXILIARY INLET VALVE



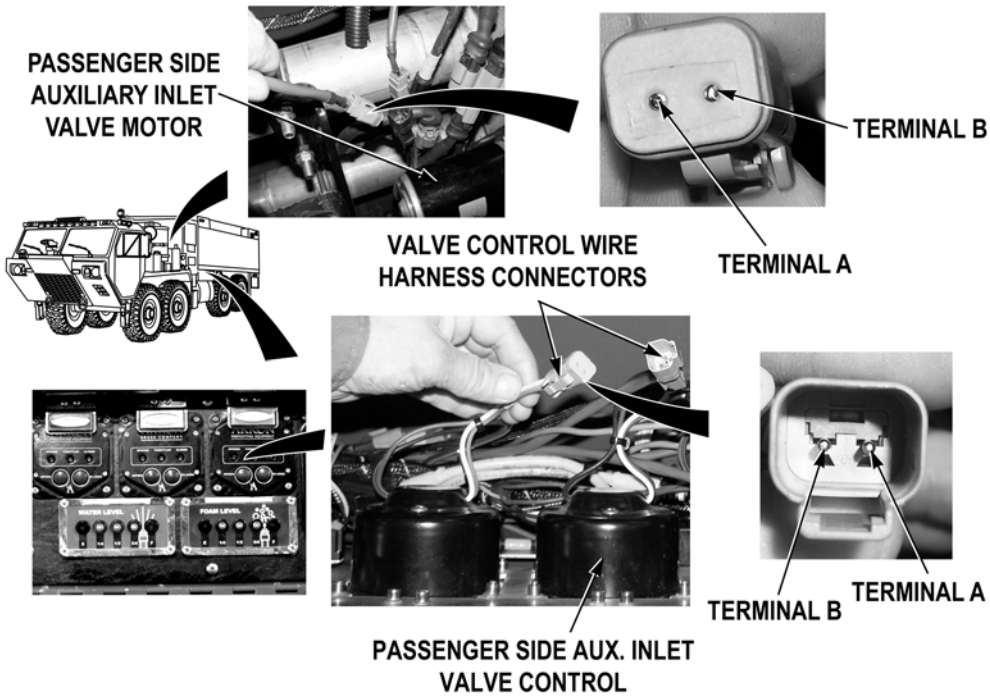
NOTE

- Do not engage PUMP PTO during this procedure. Valve operations can be checked without water pump operations.
- Valve motor operation can be checked either by noting vibration of valve assembly, or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.
- Do not remove cap from PASSENGER SIDE AUX. INLET. Water may be released from the system when valve is operated.

Step 9. Push battery disconnect switch to on position (WP 0007). While an assistant pushes pump operator’s panel PASSENGER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if PASSENGER SIDE AUX. INLET valve control THROTTLED (yellow) indicator illuminates and passenger side auxiliary inlet valve motor operates.

If indicator illuminates and valve motor operates, replace passenger side auxiliary inlet valve drive assembly (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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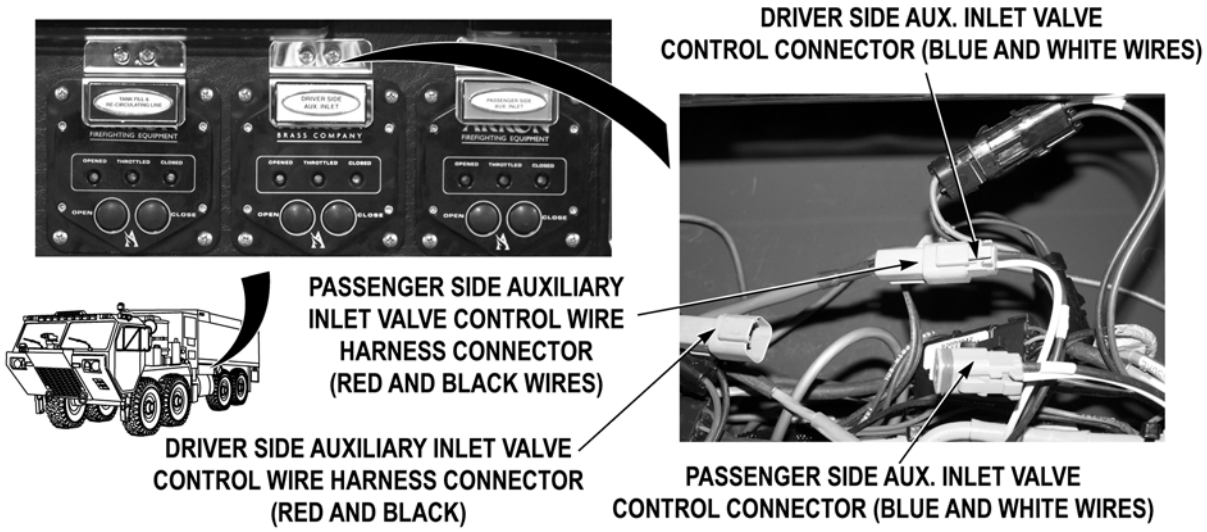
Step 10. Pull battery disconnect switch to off position (WP 0007). Disconnect valve control wire harness connectors from PASSENGER SIDE AUX. INLET valve control and passenger side auxiliary inlet valve motor. With a test lead set, check for continuity across passenger side auxiliary inlet valve control wire harness valve control to passenger side auxiliary inlet valve motor connector, terminal to terminal.

If there is no continuity, repair wires if repairable (TM 9-2320-315-14&P), or replace passenger side auxiliary inlet valve control wire harness (WP 0286).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

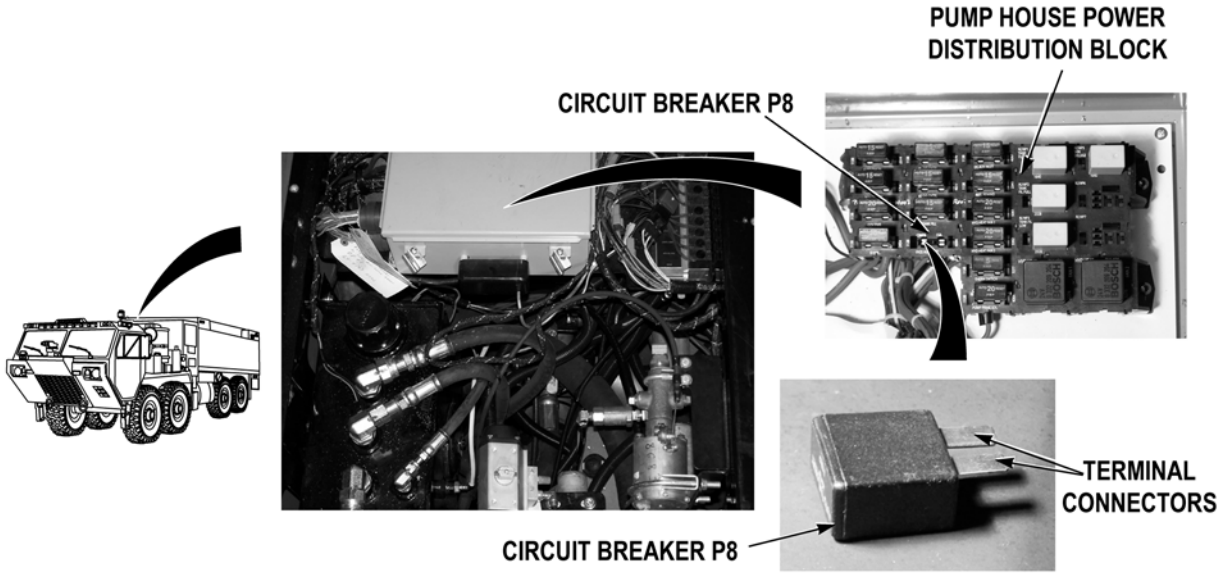


Step 11. Connect passenger side auxiliary inlet valve control wire harness connector to passenger side auxiliary inlet valve motor. Disconnect driver side auxiliary inlet valve control wire harness connector from DRIVER SIDE AUX. INLET valve control. Connect passenger side auxiliary inlet valve control wire harness connector to DRIVER SIDE AUX. INLET valve control connector. Push battery disconnect switch to on position (WP 0007). While an assistant pushes pump operator's panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if passenger side auxiliary inlet valve operates.

a. If passenger side auxiliary inlet valve operates, reconnect valve control wire harness connectors to original positions and replace PASSENGER SIDE AUX. INLET valve control (WP 0207).

b. If passenger side auxiliary inlet valve does not operate, reconnect valve control wire harness connectors to original positions and replace passenger side auxiliary inlet valve motor (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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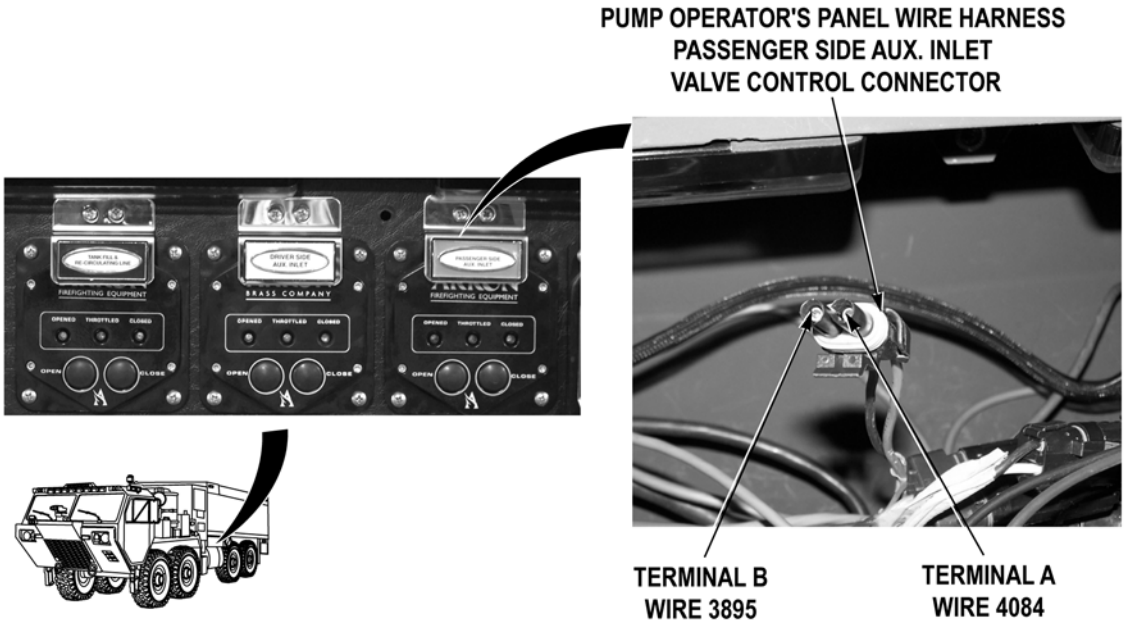
Step 12. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P8 (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P8 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Install circuit breaker P8 (WP 0261). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness PASSENGER SIDE AUX. INLET valve control connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between pump operator's panel wire harness wire 4084 (white) at PASSENGER SIDE AUX. INLET valve control connector, terminal A and a known good ground.

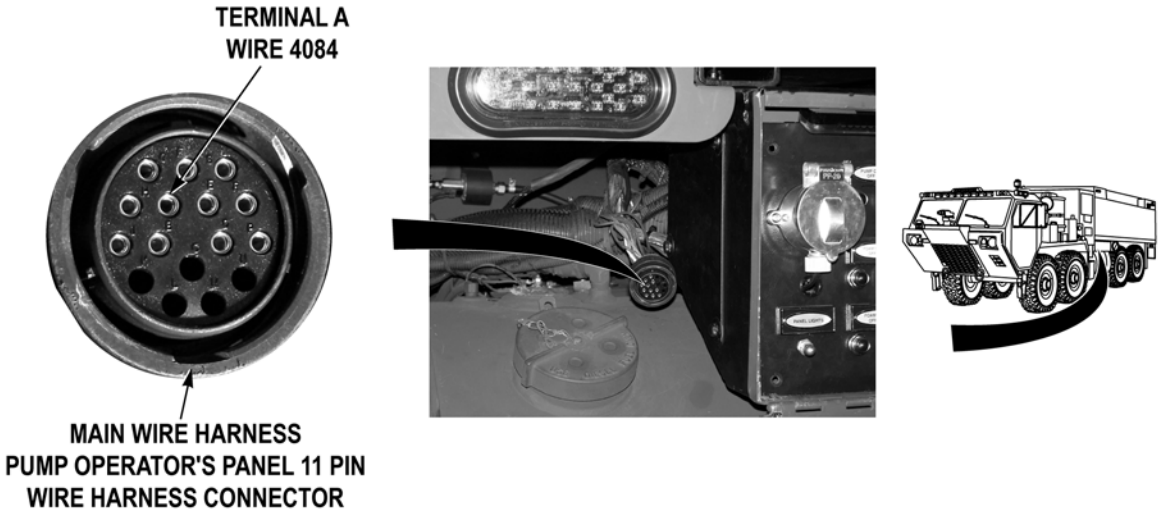
If 22 to 28 VDC are not present, go to Step 15.

Step 14. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 3895 (black) from pump operator's panel wire harness PASSENGER SIDE AUX. INLET valve control connector, terminal B to a known good ground.

a. If there is continuity, replace PASSENGER SIDE AUX. INLET valve control (WP 0207).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

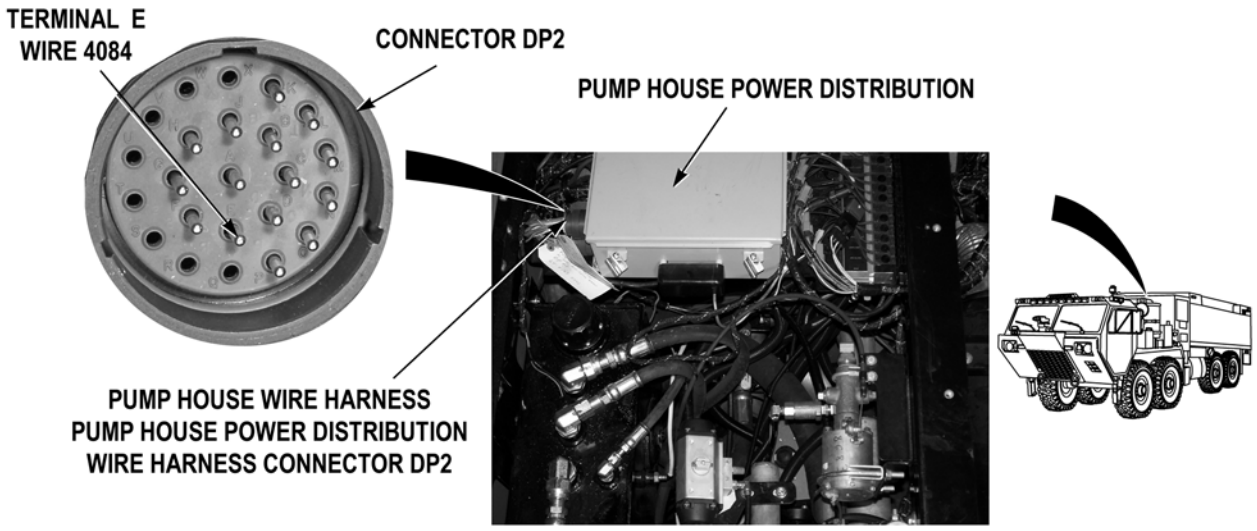
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Disconnect main wire harness pump operator's panel 11 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 4084 (white) at main wire harness pump operator's panel 11 pin wire harness connector, terminal A and a known good ground.

If 22 to 28 VDC are present, repair wire 4084 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 4084 (white) at connector DP2, terminal E and a known good ground.

a. If 22 to 28 VDC are present, repair wire 4084 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If 22 to 28 VDC are not present, repair wire 4084 in power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace power distribution wire harness and block (WP 0300).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP COOLER VALVE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Test Lead Set (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0197
WP 0203
WP 0205
WP 0219
WP 0240

References (continued)
WP 0242
WP 0270
WP 0280
WP 0281
WP 0293
WP 0303
WP 0304
WP 0321
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

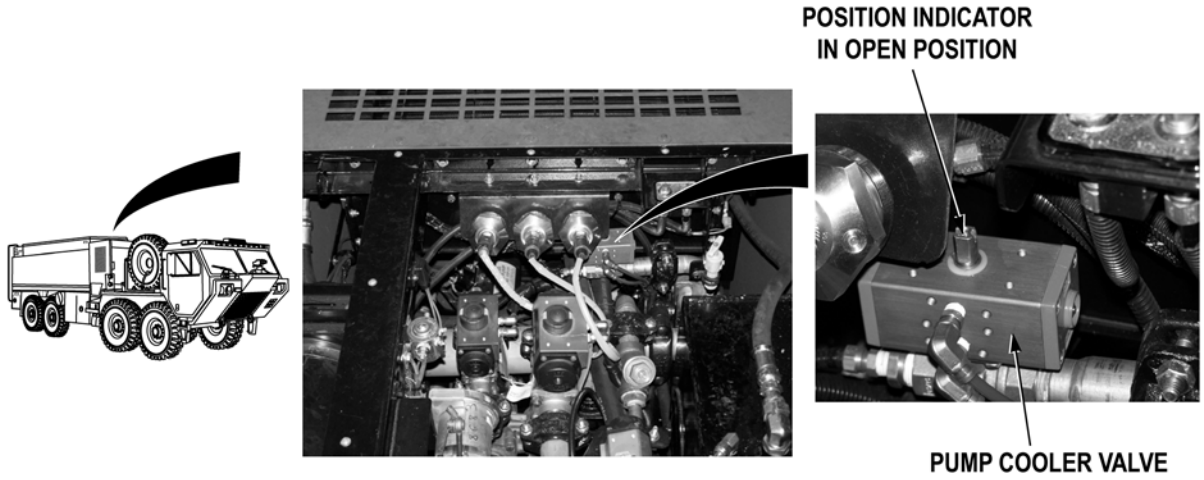
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PUMP COOLER VALVE DOES NOT OPERATE PROPERLY

NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Remove pump house panel K (WP 0341). While an assistant puts and holds pump operator's panel PUMP COOLER switch to ON position (WP 0004), check if pump cooler valve operates to open position.

If pump cooler valve does not operate to open position, go to Step 27.

Step 2. Check if pump cooler valve remains in open position, when assistant releases pump operator's panel PUMP COOLER switch (WP 0004).

If pump cooler valve does not remain in open position, go to Step 18.

Step 3. While an assistant puts pump operator's panel PUMP COOLER switch to OFF position (WP 0004), check if pump cooler valve operates to closed position.

If pump cooler valve does not operate to closed position, go to Step 12.

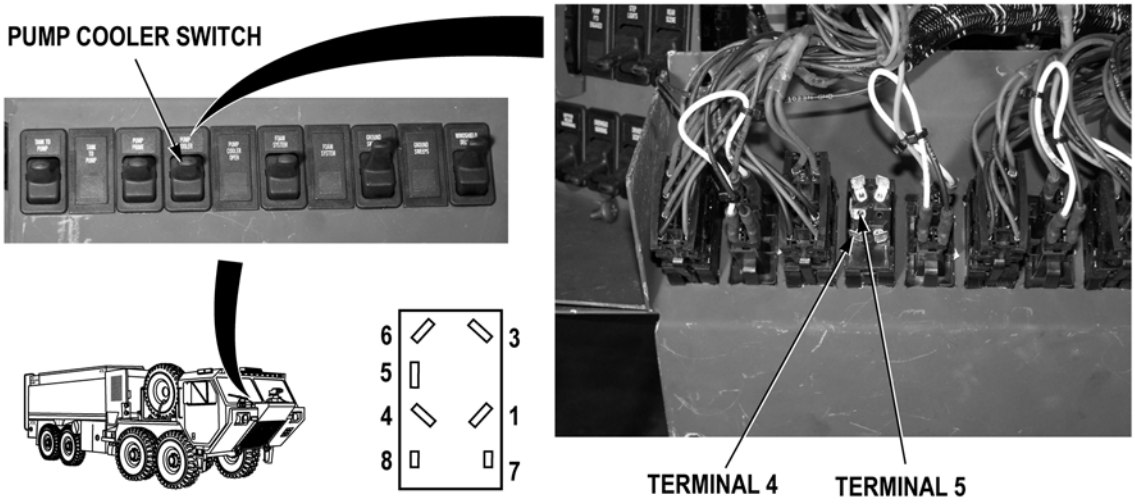
Step 4. While an assistant puts cab PUMP COOLER switch to on position (WP 0004), check if pump cooler valve operates to open position.

If pump cooler valve does not operate to open position, go to Step 8.

Step 5. While an assistant puts cab PUMP COOLER switch to off position (WP 0004), check if pump cooler valve operates to closed position.

If pump cooler valve operates to closed position, pump cooler valve control is operating correctly.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



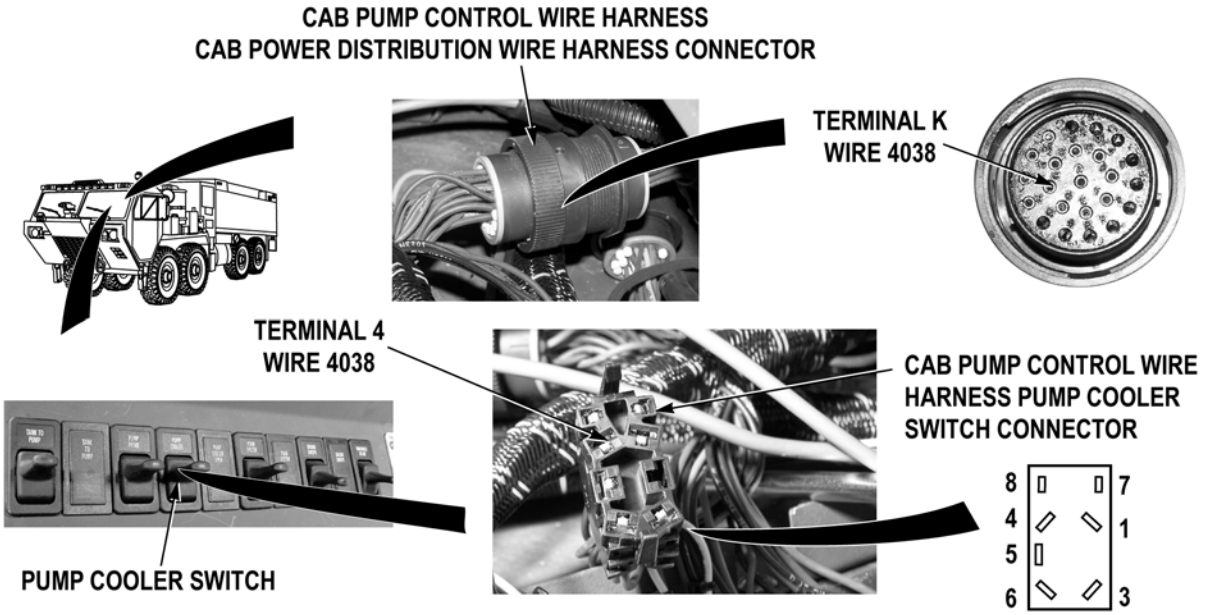
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 6. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness PUMP COOLER switch connector. While an assistant holds switch in off position, check for continuity across PUMP COOLER switch, from terminal 5 to terminal 4.

If there is no continuity, replace cab PUMP COOLER switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

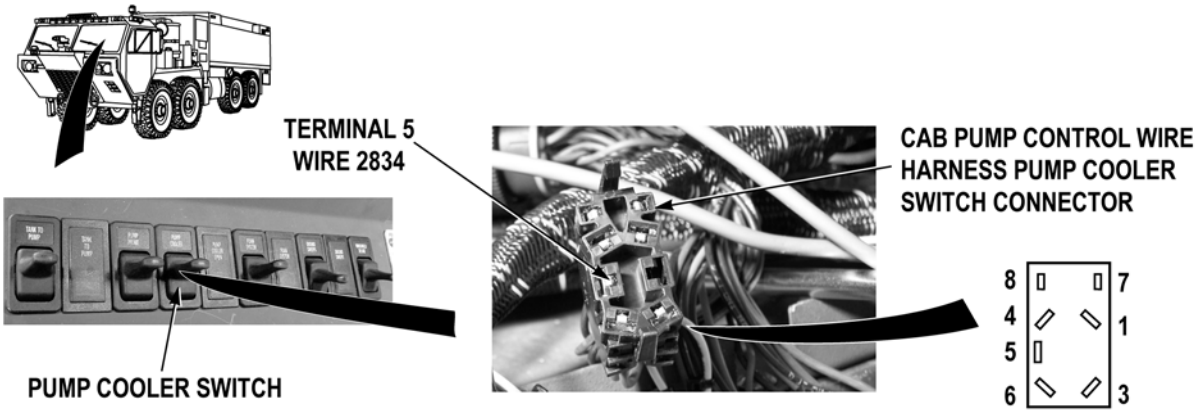


Step 7. Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 4038 (brown) from PUMP COOLER switch connector, terminal 4 to cab pump control wire harness connector, terminal K.

a. If there is continuity, repair wire 4038 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 4038 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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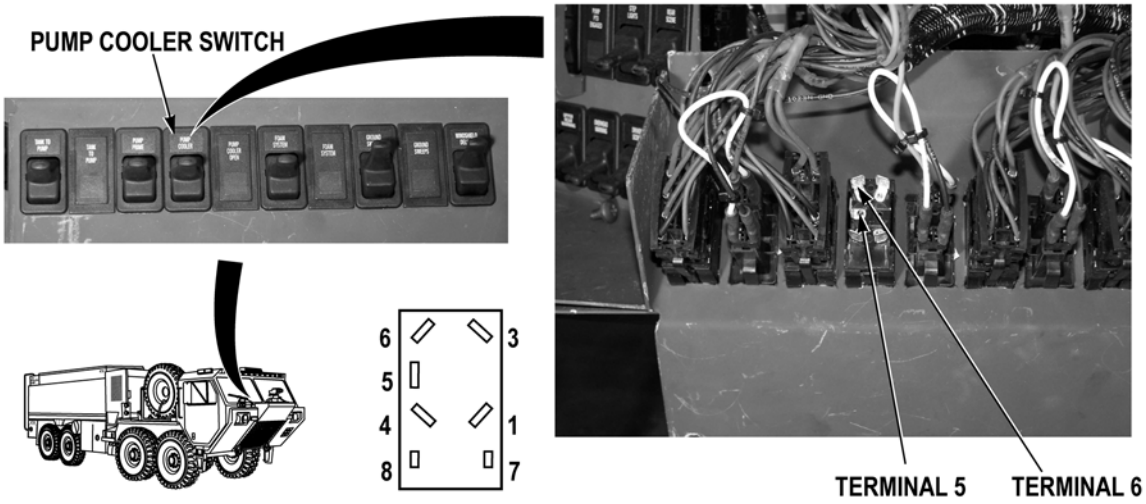
Step 8. Release PUMP COOLER switch (WP 0004). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness PUMP COOLER switch connector. Check for 22 to 28 VDC between cab pump control wire harness wire 2834 (red) at PUMP COOLER switch connector, terminal 5 and a known good ground.

If 22 to 28 VDC are not present, go to Step 11.

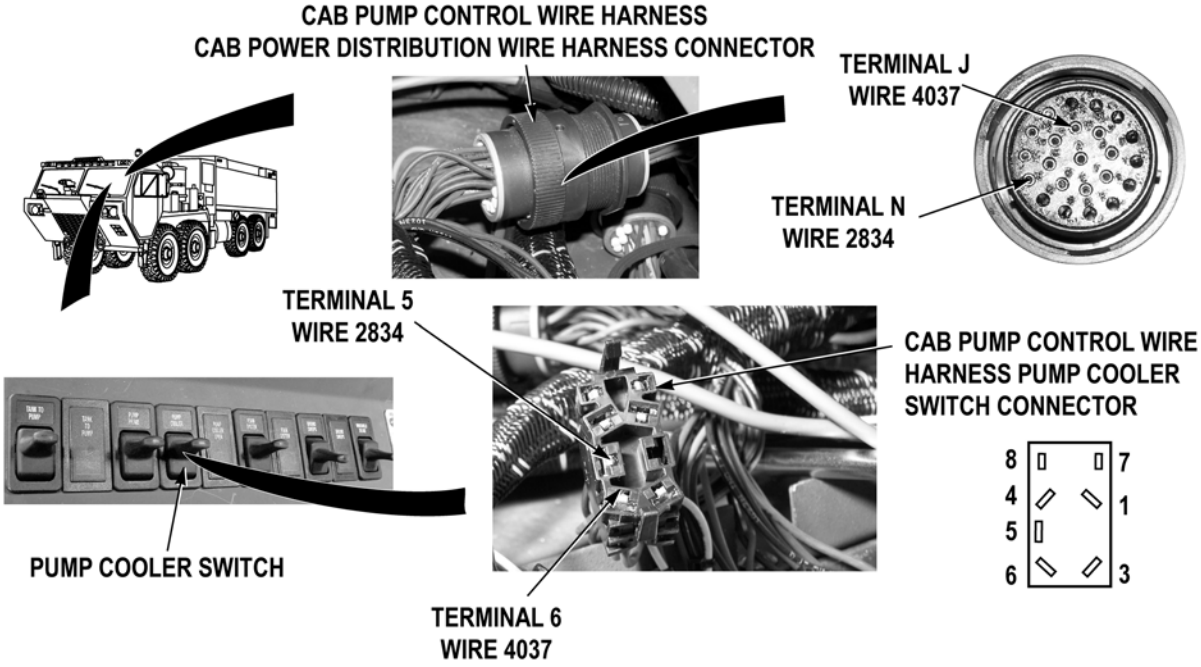
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Pull battery disconnect switch to off position (WP 0007). While an assistant holds switch in on position, check for continuity across PUMP COOLER switch, from terminal 5 to terminal 6.

If there no continuity, replace cab PUMP COOLER switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 4037 (orange) from PUMP COOLER switch connector, terminal 6 to cab pump control wire harness connector, terminal J.

a. If there is continuity, repair wire 4037 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

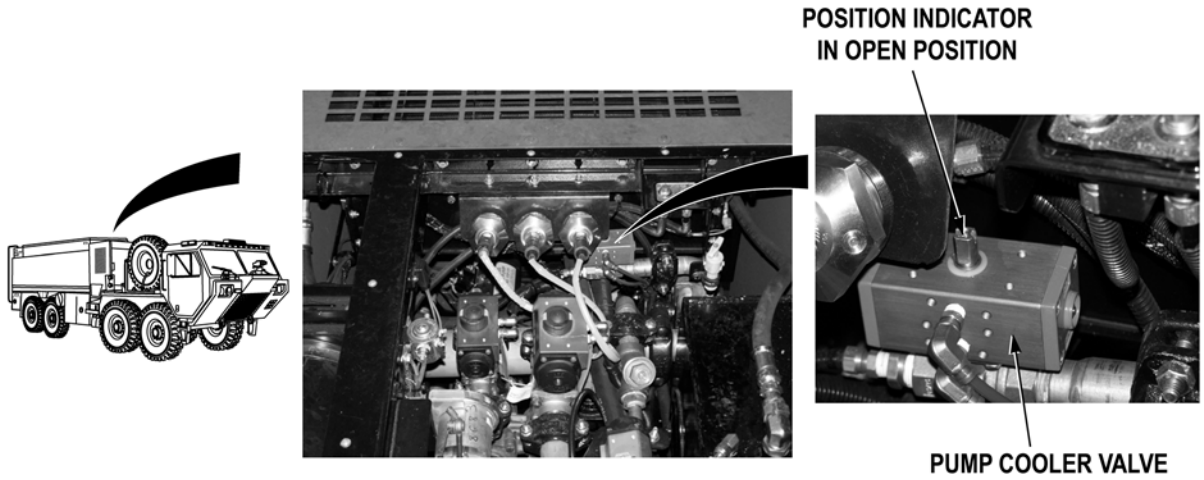
b. If there is no continuity, repair wire 4037 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

Step 11. Pull battery disconnect switch to off position (WP 0007). Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 2834 (red) from PUMP COOLER switch connector, terminal 5 to cab pump control wire harness connector, terminal N.

a. If there is continuity, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2834 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



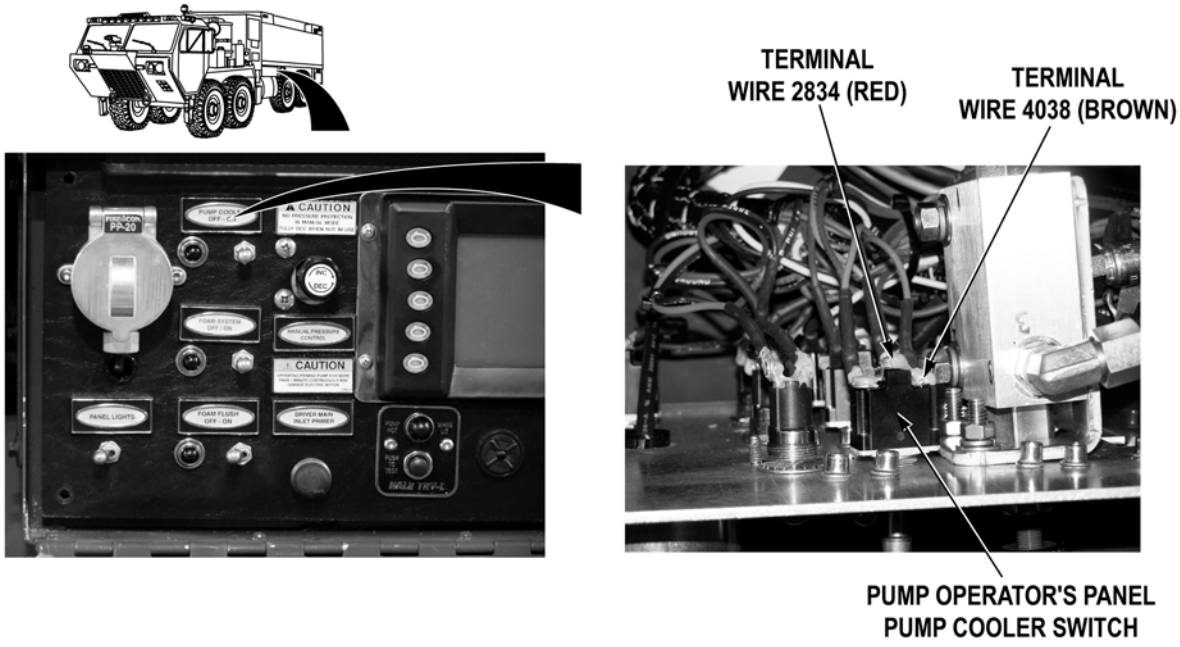
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

Step 12. Release pump operator's panel PUMP COOLER switch (WP 0004). While an assistant puts cab PUMP COOLER switch to off position (WP 0004), check if pump cooler valve operates to closed position.

If pump cooler valve does not operate to closed position, go to Step 16.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



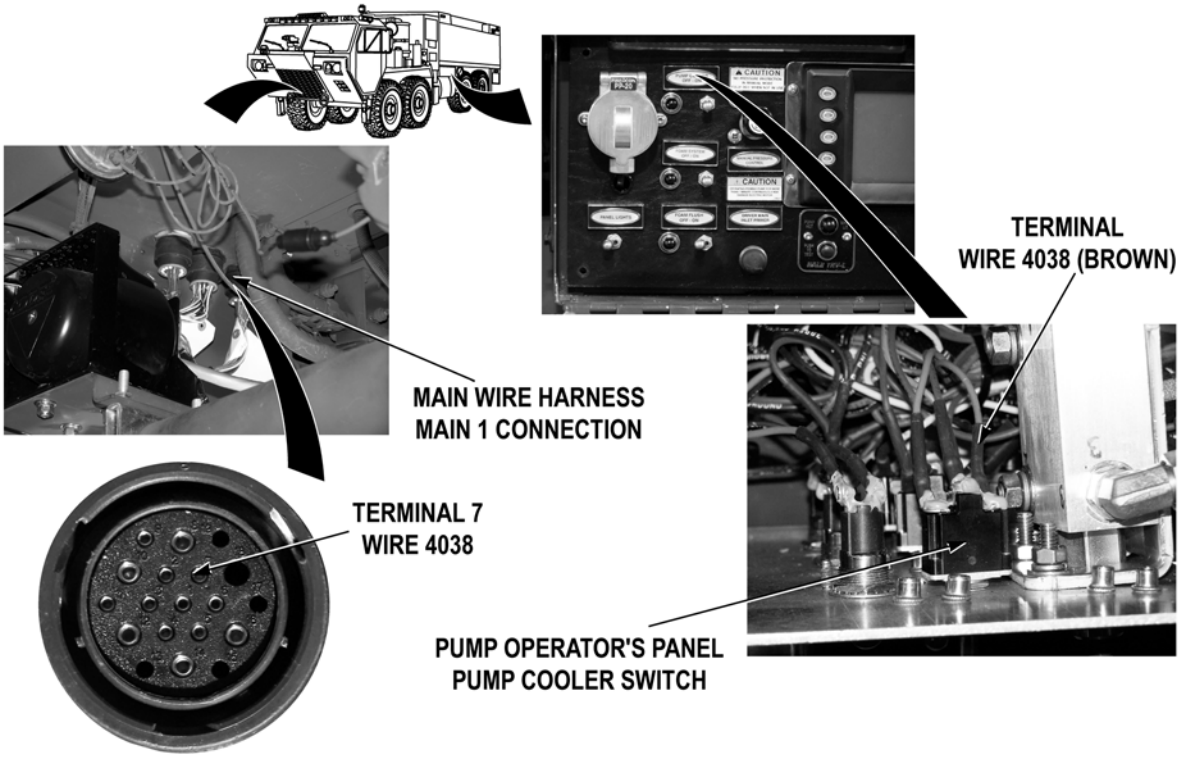
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 13. Release PUMP COOLER switch (WP 0004). Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel PUMP COOLER switch, from terminal wire 2834 (red) to terminal wire 4038 (brown), while an assistant puts and holds switch in ON position.

If there is no continuity, replace pump operator's panel PUMP COOLER switch (WP 0219).

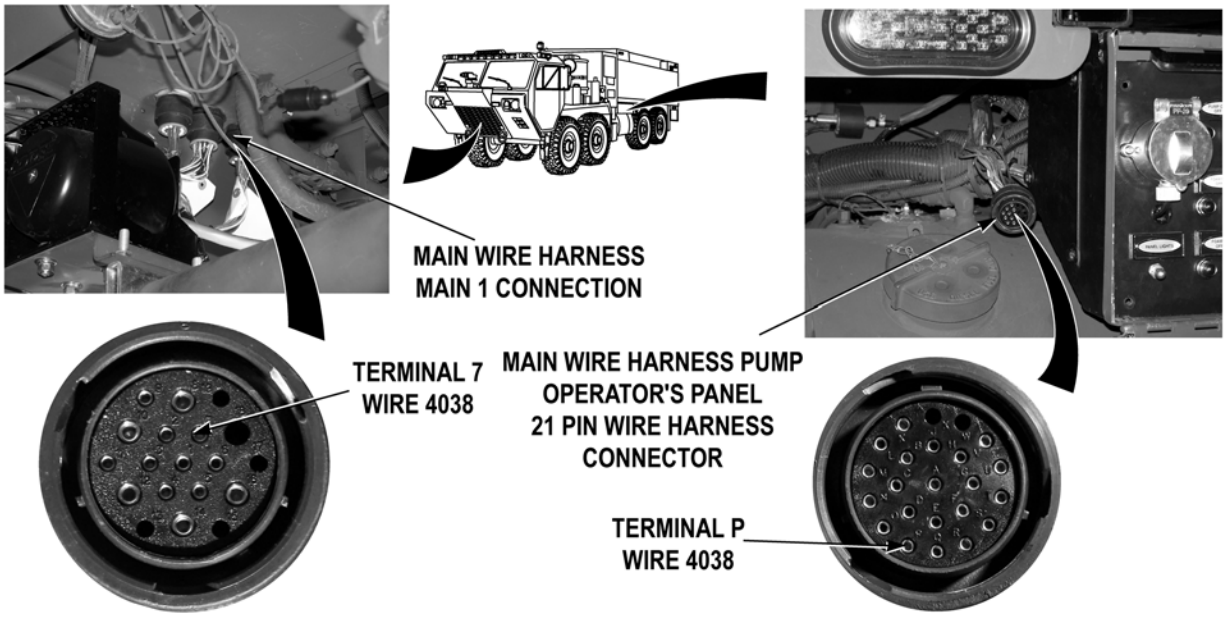
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across wire 4038 (brown) from pump operator's panel PUMP COOLER switch, terminal to main wire harness main 1 connector, terminal 7.

If there is continuity, repair wire 4038 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

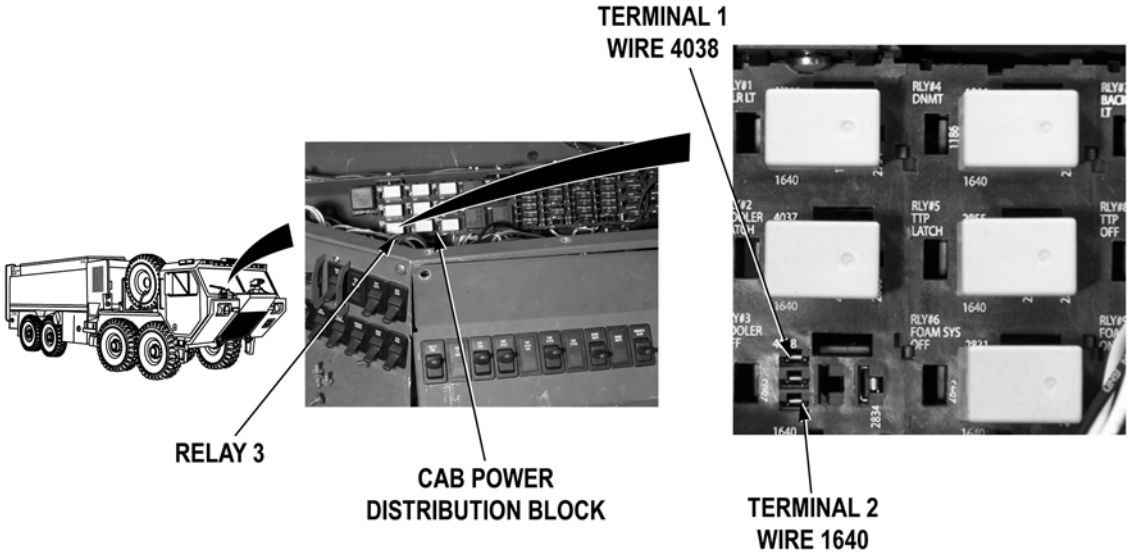


Step 15. Disconnect main wire harness pump operator’s panel 21 pin wire harness connector. With a test lead set, check for continuity across main wire harness wire 4038 (brown) from main wire harness pump operator’s panel 21 pin wire harness connector, terminal P to main 1 connector, terminal 7.

a. If there is continuity, repair wire 4038 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

b. If there is no continuity, repair wire 4038 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 16. Release PUMP COOLER switch (WP 0004). Remove cab instrument panel A (WP 0203). Remove relay 3 (WP 0242). While an assistant holds cab PUMP COOLER switch to off position (WP 0004), check for 22 to 28 VDC between cab power distribution wire harness wire 4038 (brown) at relay 3 connector, terminal 1 and a known good ground.

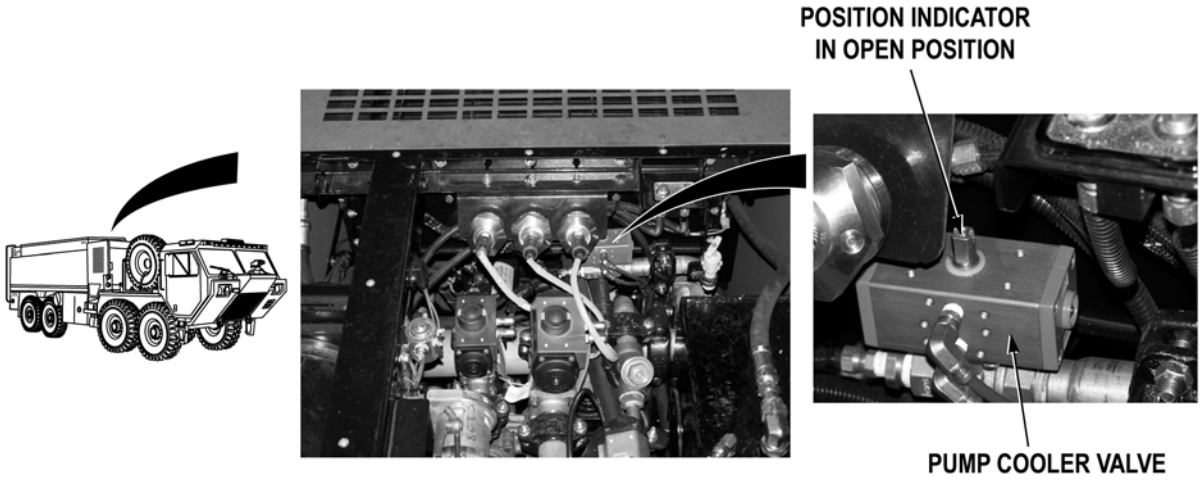
If 22 to 28 VDC are not present, repair wire 4038 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

Step 17. Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab power distribution wire harness wire 1640 (black) from relay 3 connector, terminal 2 to a known good ground.

a. If there is continuity, replace relay 3 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

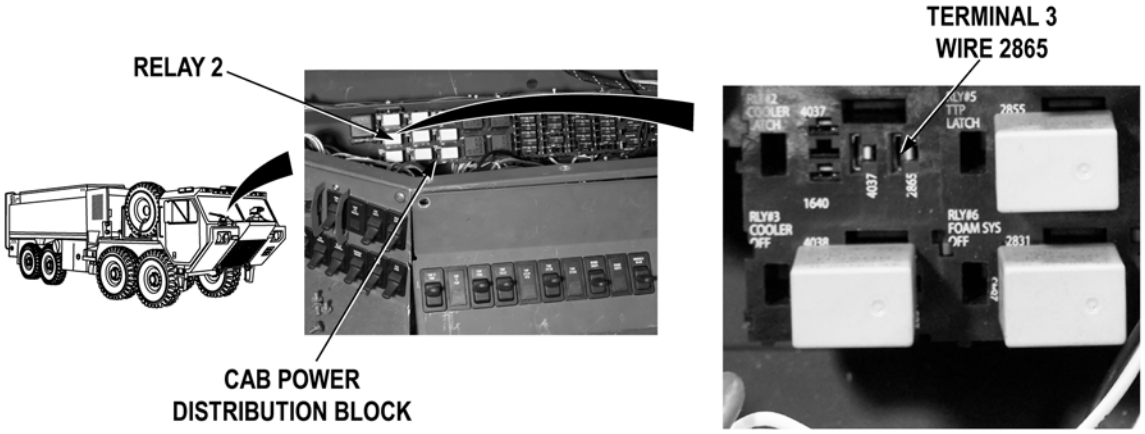
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. While an assistant puts cab PUMP COOLER switch to on position (WP 0004), check if pump cooler valve operates to open position.

If pump cooler valve does not operate to open position, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



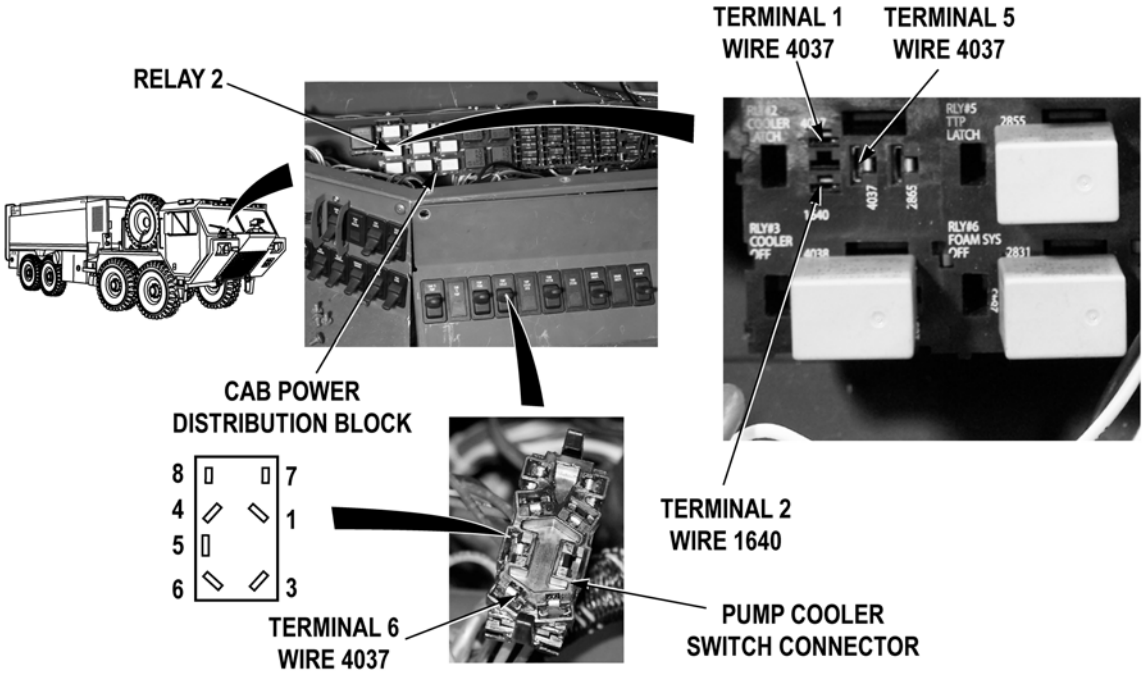
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 19. Put cab PUMP COOLER switch to off position (WP 0004). Remove cab instrument panel A (WP 0203). Remove relay 2 (WP 0242). Check for 22 to 28 VDC between cab power distribution wire harness wire 2865 (gray) at relay 2 connector, terminal 3 and a known good ground.

If 22 to 28 VDC are not present, go to Step 24.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 20. Pull battery disconnect switch to off position (WP 0007). Check for continuity across wire 4037 (orange) from cab pump control wire harness PUMP COOLER switch connector, terminal 6 to cab power distribution wire harness relay 2 connector, terminal 1.

If there is no continuity, go to Step 23.

Step 21. Check for continuity across cab power distribution wire harness wire 1640 (black) from relay 2 connector, terminal 2 to a known good ground.

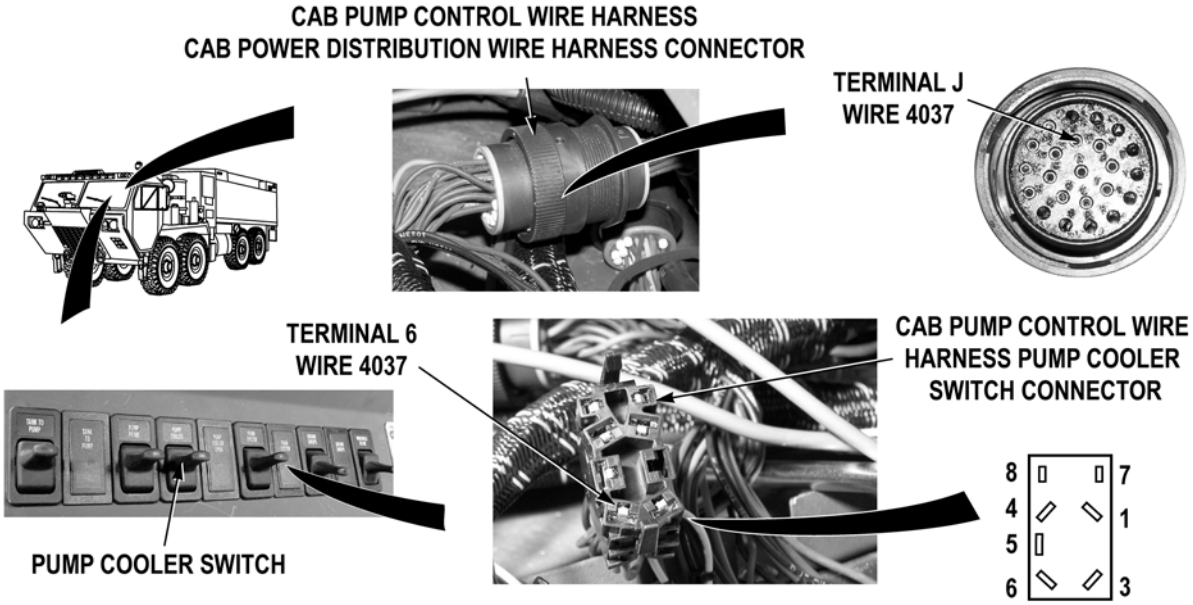
If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

Step 22. Check for continuity across cab power distribution wire harness wire 4037 (orange) from relay 2 connector, terminals 1 to relay 2 connector, terminal 5.

a. If there is continuity, replace relay 2 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

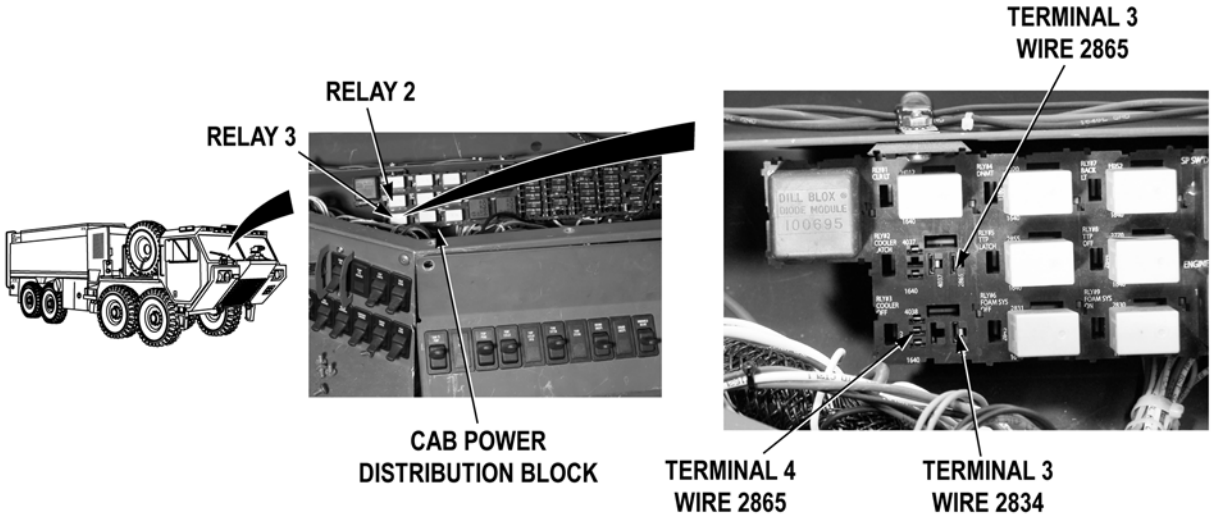
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 23. Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 4037 (orange) from PUMP COOLER switch connector, terminal 6 to cab pump control wire harness connector, terminal J.

a. If there is continuity, repair wire 4037 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 4037 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 24. Remove relay 3 (WP 0242). Check for 22 to 28 VDC between cab power distribution wire harness wire 2834 (red) at relay 3 connector, terminal 3 and a known good ground.

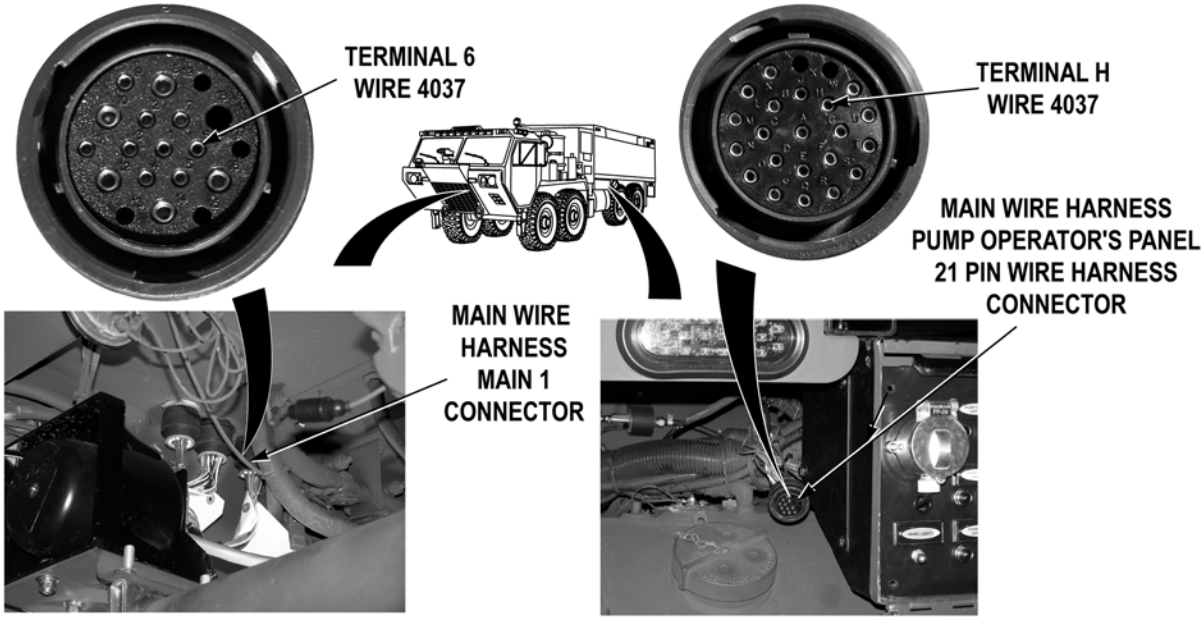
If 22 to 28 VDC are not present, replace cab power distribution wire harness and block (WP 0280).

Step 25. Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab power distribution wire harness wire 2865 (gray) from relay 3 connector, terminal 4 to relay 2 connector, terminal 3.

a. If there is continuity, replace relay 2 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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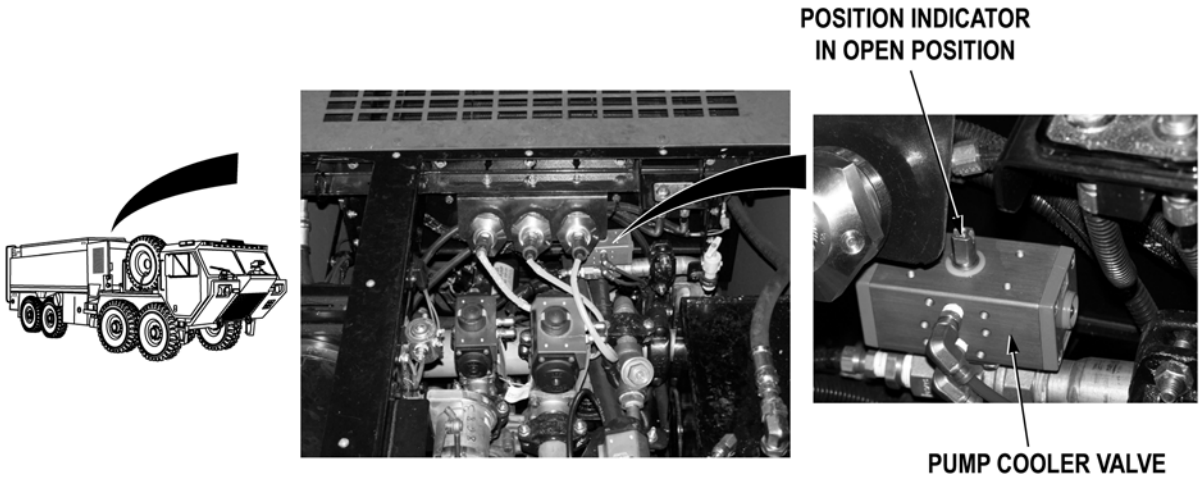
Step 26. Disconnect main wire harness pump operator's panel 21 pin wire harness connector. Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 4037 (orange) from main wire harness pump operator's panel 21 pin wire harness connector, terminal H to main 1 connector, terminal 6.

a. If there is continuity, repair wire 4037 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 4037 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

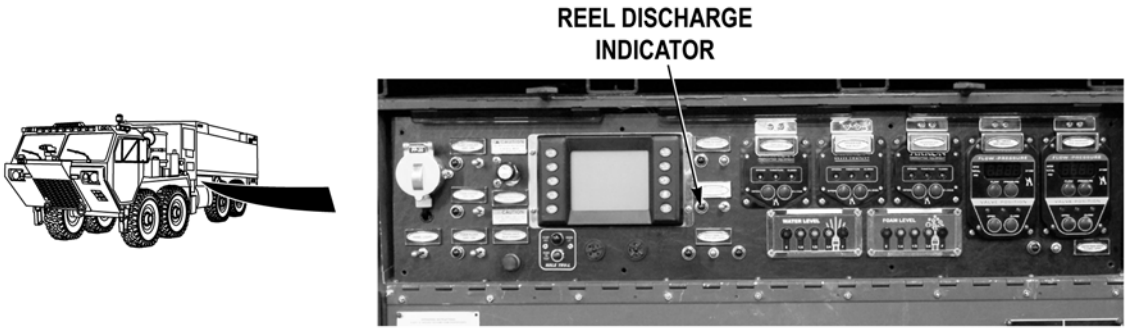


NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

Step 27. While an assistant puts cab PUMP COOLER switch to on position (WP 0004), check if pump cooler valve operates to open position.

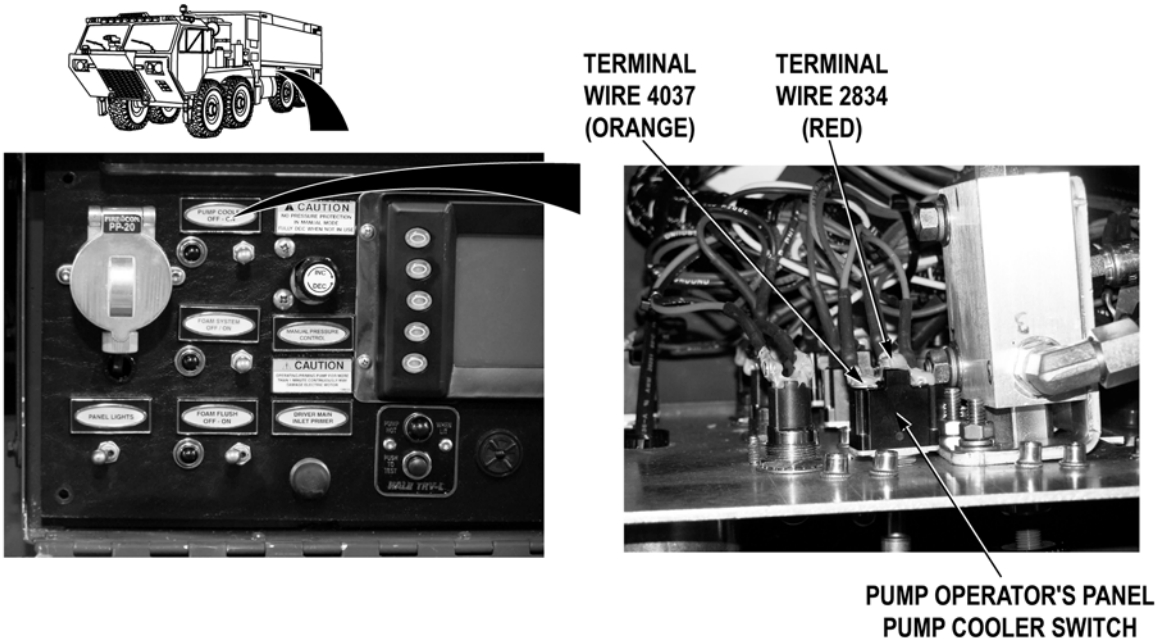
If pump cooler valve does not operate to open position, go to Step 34.



Step 28. Put cab PUMP COOLER switch to off position (WP 0004). Put pump operator's panel REEL DISCHARGE switch to ON position (WP 0004). Check if REEL DISCHARGE indicator illuminates.

If REEL DISCHARGE indicator does not illuminate, go to Step 32.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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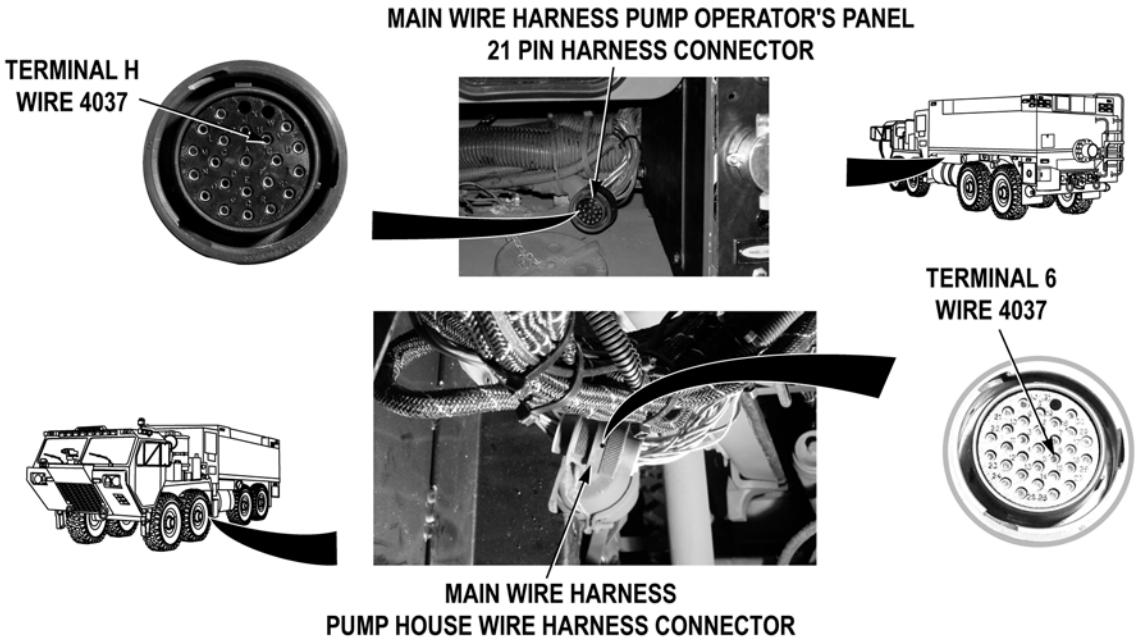
Step 29. Put pump operator's panel REEL DISCHARGE switch to OFF position (WP 0004). Open pump operator's panel (WP 0205). With a test lead set, check for 22 to 28 VDC between pump operator's panel wire harness wire 2834 (red) at PUMP COOLER switch, terminal and a known good ground.

If 22 to 28 VDC are not present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 30. Pull battery disconnect switch to off position (WP 0007). While an assistant holds pump operator's panel PUMP COOLER switch in ON position, check for continuity across pump operator's panel PUMP COOLER switch, from terminal wire 2834 (red) to terminal wire 4037 (orange).

If there is no continuity, replace pump operator's panel PUMP COOLER switch (WP 0219).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

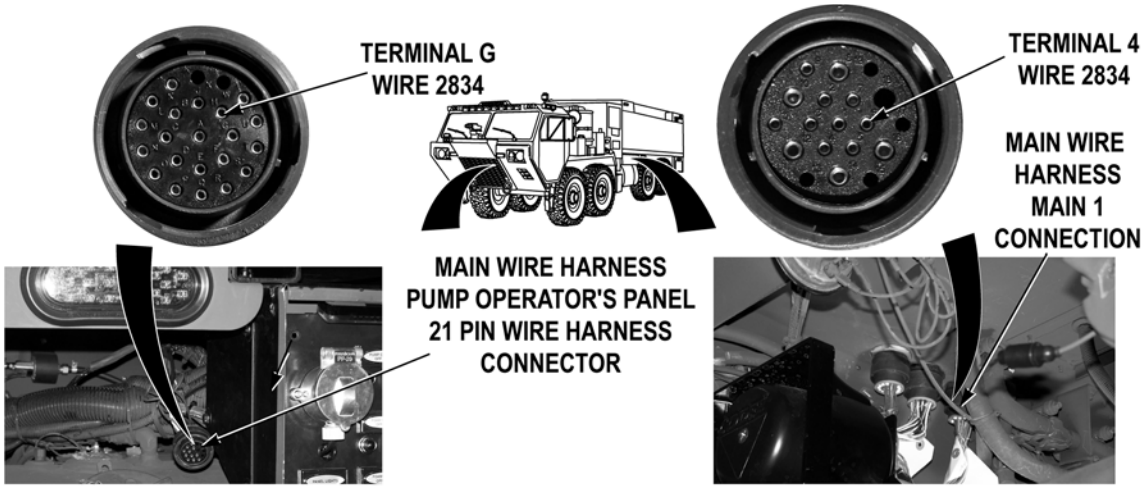


Step 31. Disconnect main wire harness pump operator's panel 21 pin wire harness connector. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across main wire harness wire 4037 (orange) from main wire harness pump operator's panel 21 pin wire harness connector, terminal H to main wire harness pump house wire harness connector, terminal 6.

a. If there is continuity, repair wire 4037 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 4037 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 32. Put pump operator's panel REEL DISCHARGE switch to OFF position (WP 0004). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2834 (red) at main wire harness pump operator's panel 21 pin wire harness connector, terminal G and a known good ground.

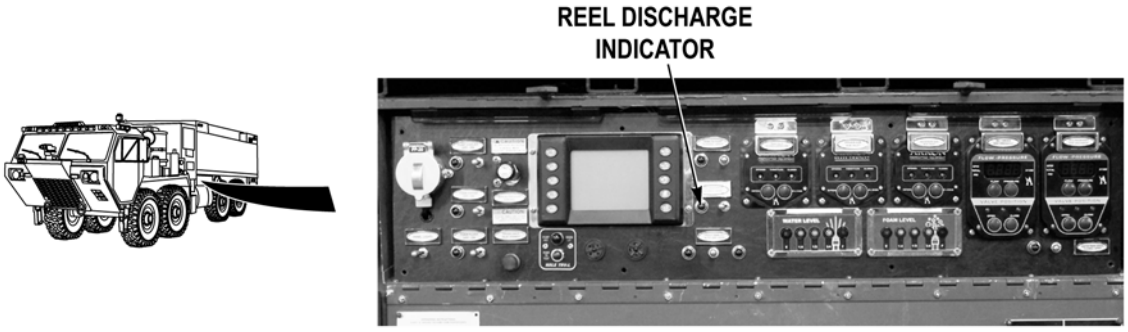
If 22 to 28 VDC are present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 33. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 2834 (red) from main 1 connector, terminal 4 to main wire harness pump operator's panel 21 pin wire harness connector, terminal G.

a. If there is continuity, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

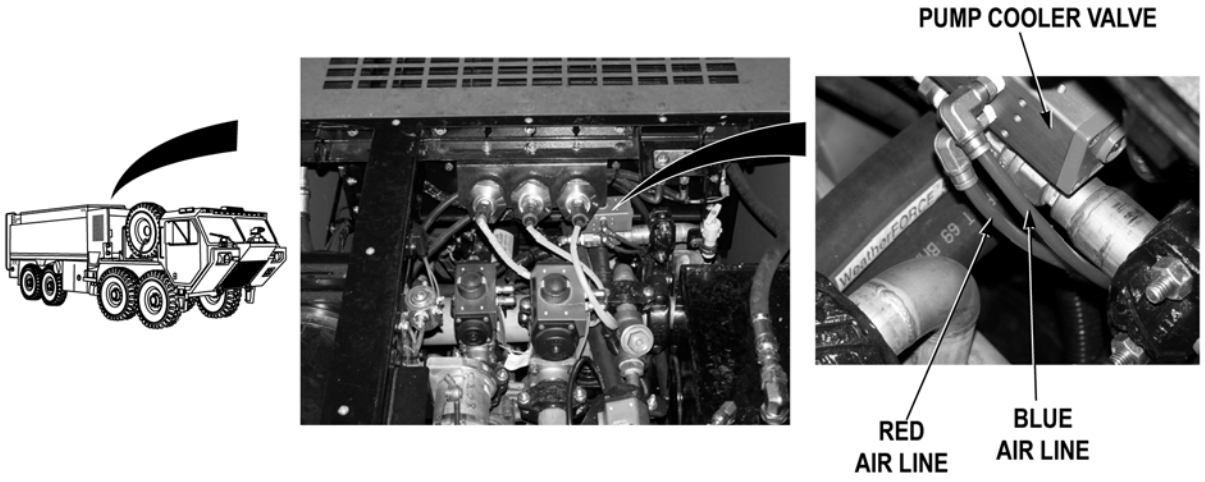
b. If there is no continuity, repair wire 2834 if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 34. Put cab PUMP COOLER switch to off position (WP 0004) and release. Put pump operator's panel REEL DISCHARGE switch to ON position (WP 0004). Check if REEL DISCHARGE indicator illuminates.

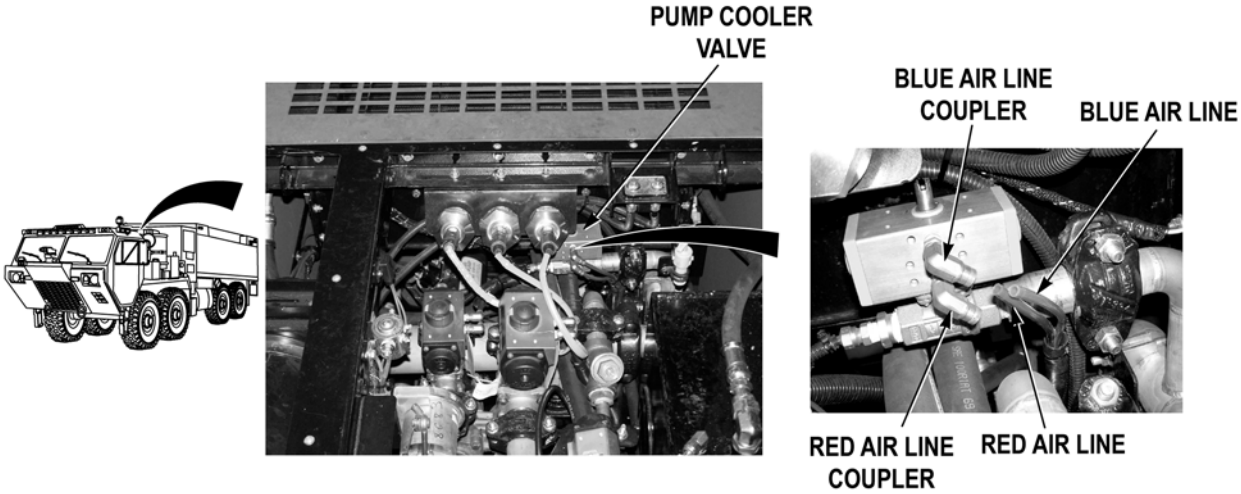
If REEL DISCHARGE indicator does not illuminate, go to Step 39.



Step 35. Put REEL DISCHARGE switch to OFF position (WP 0004). Inspect air lines from air control valve manifold to pump cooler valve for kinks and damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

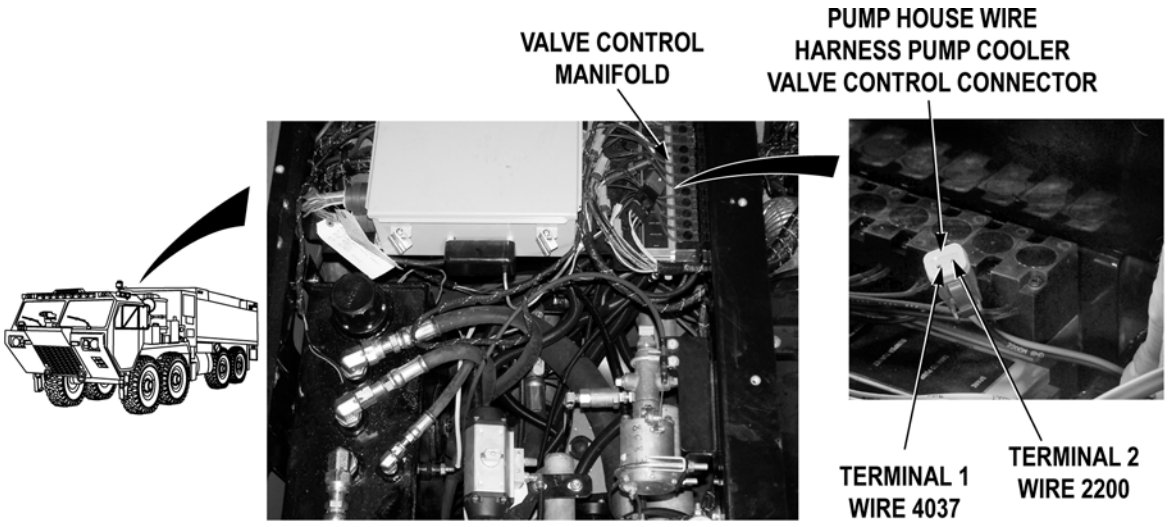
NOTE

Air pressure is checked by disconnecting air lines at pump cooler valve and observing air pressure escaping from air line, when pump cooler control valve is activated. Air will escape from blue air line when PUMP COOLER switch is put to ON position, and escape from red air line when PUMP COOLER switch is put to OFF position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 36. Disconnect air lines at pump cooler valve. While an assistant puts cab or pump operator's panel PUMP COOLER switch to ON and OFF positions (WP 0004), check if air pressure is present at pump cooler valve.

If there is air pressure, replace pump cooler valve (WP 0321).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 37. Disconnect pump house wire harness pump cooler valve control connector. Put cab or pump operator's panel PUMP COOLER switch to ON position (WP 0004) and release. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4037 (orange) at pump house wire harness pump cooler valve control connector, terminal 1 and a known good ground.

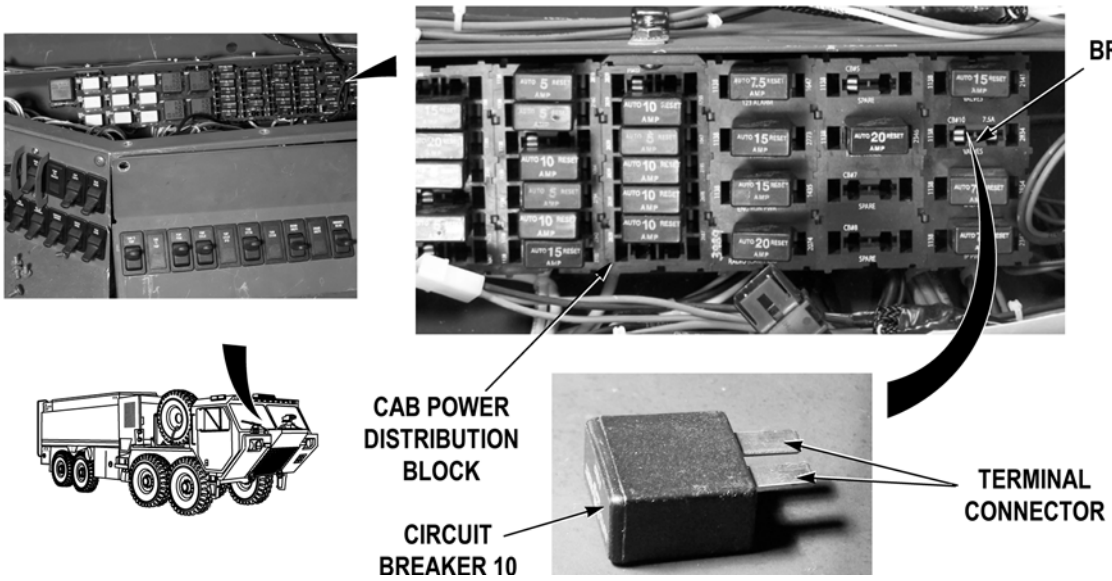
If 22 to 28 VDC are not present, repair wire 4037 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness.

Step 38. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness pump cooler valve control connector, terminal 2 to a known good ground.

a. If there is continuity, replace pump cooler control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 39. Put REEL DISCHARGE switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 10 (WP 0240). Check for continuity across circuit breaker.

a. If there is continuity, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, replace circuit breaker 10 (WP 0240).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PRESSURE GOVERNOR CONTROLS DO NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0009
WP 0010
WP 0016
WP 0017
WP 0055
WP 0087
WP 0094
WP 0100
WP 0121
WP 0139
WP 0140
WP 0142

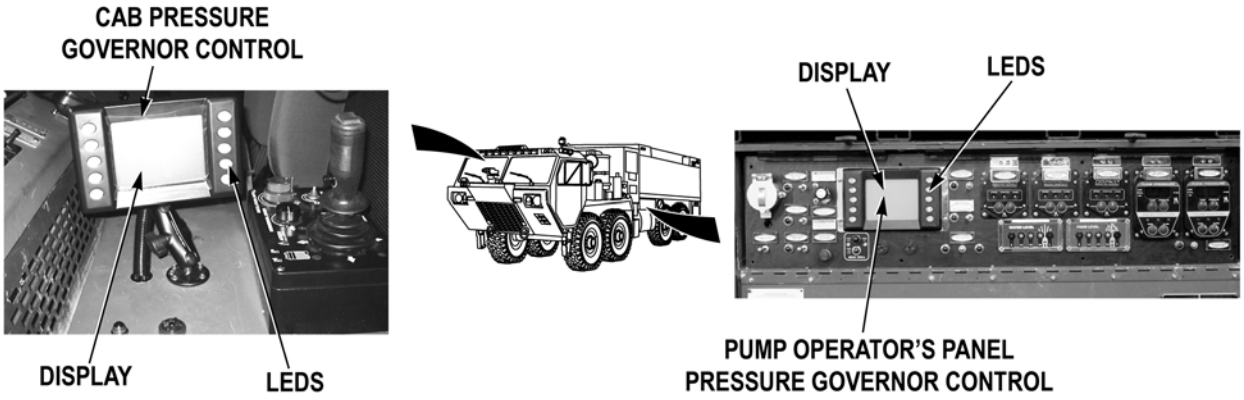
References (continued)
WP 0144
WP 0148
WP 0149
WP 0150
WP 0156
WP 0195
WP 0203
WP 0205
WP 0242
WP 0264
WP 0279
WP 0280
WP 0289
WP 0293
WP 0303
WP 0304
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PRESSURE GOVERNOR CONTROLS DO NOT OPERATE PROPERLY

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Pressure governor control contrast, brightness, and backlighting can be adjusted to make pressure governor control appear to be inactive.

Step 1. Open pump operator's panel (WP 0010). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Turn ENGINE switch to ON position (TM 9-2320-279-10). Check if cab and/or pump operator's panel pressure governor control display and LEDs illuminate after initializing.

If cab and/or pump operator's panel pressure governor control does not produce a display, go to Step 89.

Step 2. Check if cab pressure governor control display contrast, brightness, and backlighting adjustments are set to allow indication of system operations (WP 0016).

If adjustments are set to allow indication of system operations, go to Step 4.

NOTE

- Contrast can be set by user ranging from 0% to 100%. Default setting is 50%.
- Brightness can be set by user ranging from 0% to 100%. Default setting is 50%.
- Backlighting can be set by user ranging from 0% to 100%. Default setting is 50%.

Step 3. At cab pressure governor control, press back button to display menu selection screen (WP 0016). Press scroll up/down button until SETTINGS is selected (WP 0016). Press OK button (WP 0016). Adjust cab pressure governor control contrast, brightness, and backlighting for suitable display. Press back button until home screen is displayed (WP 0016).

a. If cab pressure governor control cannot be adjusted to a usable display, replace cab pressure governor control (WP 0195).

b. If adjustments are made and cab pressure governor control functions properly, fault has been corrected, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 4. Check if pump operator's panel pressure governor control display contrast, brightness, and backlighting adjustments, are set to allow indication of system operations (WP 0016).

If adjustments are set to allow indication of system operations, go to Step 6.

NOTE

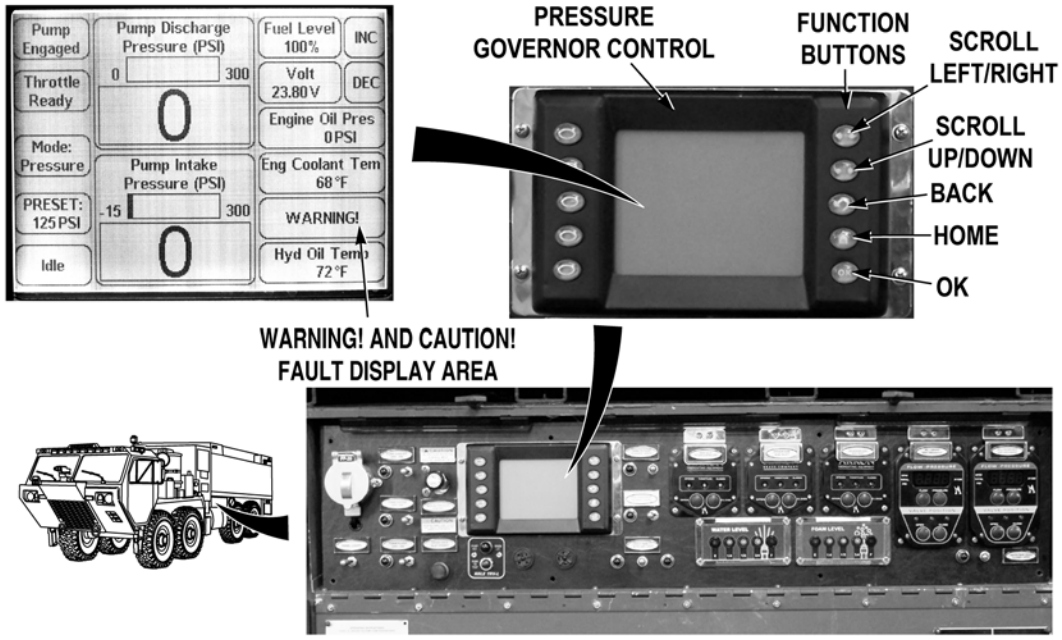
- Contrast can be set by user ranging from 0% to 100%. Default setting is 50%.
- Brightness can be set by user ranging from 0% to 100%. Default setting is 50%.
- Backlighting can be set by user ranging from 0% to 100%. Default setting is 50%.

Step 5. At pump operator's panel pressure governor control, press back button to display menu selection screen (WP 0016). Press scroll up/down button until SETTINGS is selected (WP 0016). Press OK button (WP 0016). Adjust pump operator's panel pressure governor control contrast, brightness, and backlighting for suitable display. Press back button until home screen is displayed (WP 0016).

a. If pump operator's panel governor control cannot be adjusted to a usable display, replace pump operator's panel pressure governor control (WP 0195).

b. If adjustments are made and pump operator's panel pressure governor control functions properly, fault has been corrected, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



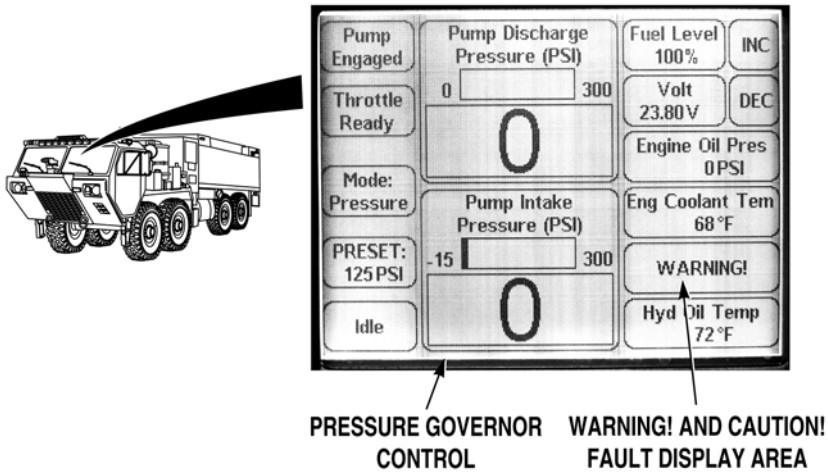
NOTE

- During initialization of pressure governor system, pressure governor control splash screen will display Pierce Manufacturing's emblem. If issues are found during initial power up sequence, system errors or warning will be logged and appropriate indicator will be activated on home screen.
- System operations may be degraded, when pressure governor WARNING! and CAUTION! are active. All system WARNING! and CAUTION! should be cleared before operations are continued.
- Some system warnings will bring water pump operations to idle. If water pump operations are brought to idle, do not attempt to restart operations until all WARNING! and CAUTION! are cleared.
- WARNING! and CAUTION! indicator will be displayed until conditions are cleared.
- Some faults will be accompanied by four "wild card" symbols (****) in display section of pressure governor control that is affected by fault.

Step 6. Start engine (TM 9-2320-279-20). At pump operator's panel, check if pressure governor control displays WARNING! indicator in Engine RPM location of Home screen (WP 0016).

If pump operator's panel pressure governor does not displays a WARNING! fault, go to Step 9.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

- Warning events initiate when a critical system failure or limit has occurred. A critical system is defined as a part or system that may cause the fire apparatus to stop flowing water immediately if no action is taken.
- Active WARNING! faults are displayed on home diagnostic screen with an “X” in Act (active) column.
- Inactive WARNING! faults are displayed on home diagnostic screen with a “—” in Act (active) column.

Step 7. If pressure governor displays WARNING! perform the following to display warnings (WP 0017).

a. Press home button to display home diagnostic screen (WP 0004).

b. Press OK button to acknowledge warning and view details of fault (WP 0004).

c. Record warning.

d. Press back button to view home diagnostic screen.

e. If more than one WARNING! fault has occurred, press scroll up/down button to select next occurring WARNING! fault.

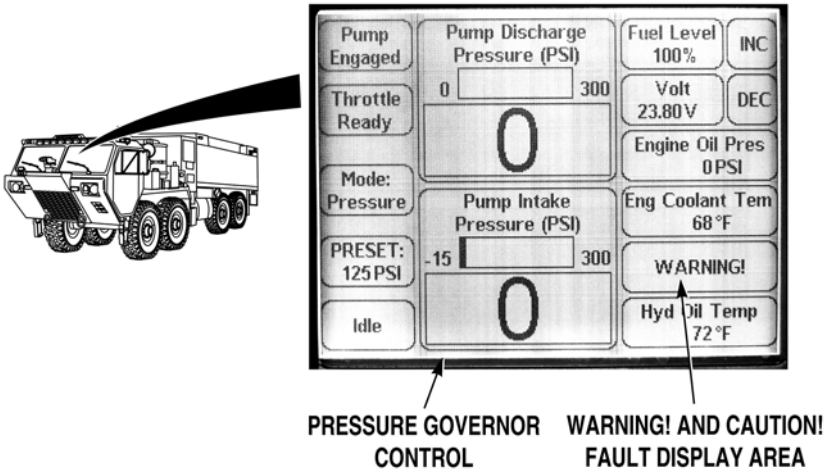
f. Press OK button to acknowledge warning and view details of fault.

g. Record warning fault.

h. Repeat Steps (d) through (g) above, until home screen is displayed.

i. With warning fault(s) recorded, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Troubleshoot WARNING! fault(s).

a. If Engine Oil Pressure Critical is displayed, troubleshoot Low Oil Pressure Gauge Indication (TM 9-2320-315-14&P).

b. If Engine Water Temp Critical is displayed, troubleshoot Engine Overheats (TM 9-2320-315-14&P).

c. If System Voltage Critical is displayed, troubleshoot either 24 Volt System Not Charging or Undercharging (65, 100, or 135 amp) or 24 Volt System Overcharging (65, 100, or 135 amp) (TM 9-2320-315-14&P).

d. If Hydraulic Oil Level Critical is displayed, go to Step 12.

e. If Pump Displacement Solenoid Failure with an Open Circuit is displayed, go to Step 15.

f. If Pump Displacement Solenoid Failure with a Short Circuit is displayed, go to Step 18.

g. If Abnormal Update Rate/CAN Communication Loss is displayed, go to Step 20.

h. If Fuel Level Critical warning is displayed, go to Step 56.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 9. At pump operator's panel, check if pressure governor control displays CAUTION! indicator in Engine RPM location of Home screen (WP 0016).

If pump operator's panel pressure governor does not displays CAUTION! fault, go to Step 106.

Step 10. If pressure governor displays CAUTION! indicator, perform the following to display cautions (WP 0017).

a. Press home button to display home diagnostic screen (WP 0004).

b. Press OK button to acknowledge caution and view details of fault (WP 0004).

c. Record caution.

d. Press back button to view home diagnostic screen.

e. If more than one CAUTION! fault has occurred, press scroll up/down button to select next occurring CAUTION! fault.

f. Press OK button to acknowledge caution and view details of fault.

g. If CAUTION! is displayed, record caution.

h. Repeat Steps (d) through (g) above, until home screen is displayed.

i. With caution faults recorded, go to Step 11.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 11. Troubleshoot CAUTION! faults.

a. If Discharge Transducer Failure with an Open Circuit is displayed, go to Step 59.

b. If Discharge Transducer Failure with a Short Circuit is displayed, go to Step 63.

c. If Intake Vacuum Transducer Failure with an Open Circuit is displayed, go to Step 68.

d. If Intake Vacuum Transducer Failure with a Short Circuit is displayed, go to Step 71.

e. If Intake Pressure Transducer Failure with an Open Circuit is displayed, go to Step 76.

f. Intake Pressure Transducer Failure with a Short Circuit is displayed, go to Step 80.

g. If Hydraulic Oil Temperature Critical is displayed, go to Step 85.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

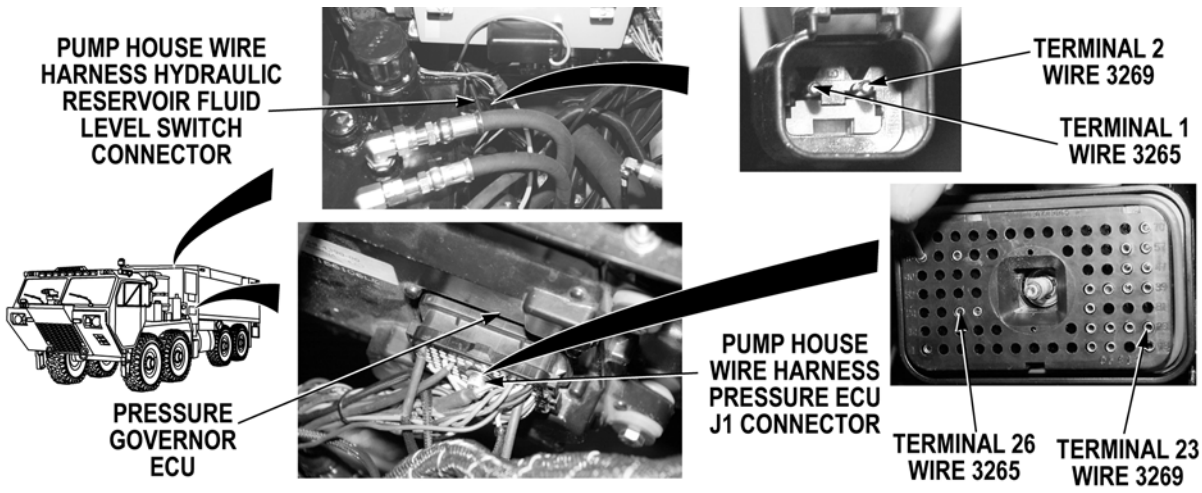
NOTE

Hydraulic oil reservoir level must be checked with vehicle parked on level ground.

Step 12. Open pump house panel K access door (WP 0008). Check hydraulic reservoir oil level at normal operating temperature.

If hydraulic oil reservoir level is low, fill to proper level (WP 0142).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 13. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness hydraulic reservoir fluid level switch connector. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3265 (yellow) from pump house wire harness hydraulic reservoir fluid level switch connector, terminal 1 to pump house wire harness pressure governor ECU J1 connector, terminal 26.

If there is no continuity, repair wire 3265 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 14. With a test lead set, check for continuity across pump house wire harness wire 3269 (black) from pump house wire harness hydraulic reservoir fluid level switch connector, terminal 2 to pump house wire harness pressure governor ECU J1 connector, terminal 23.

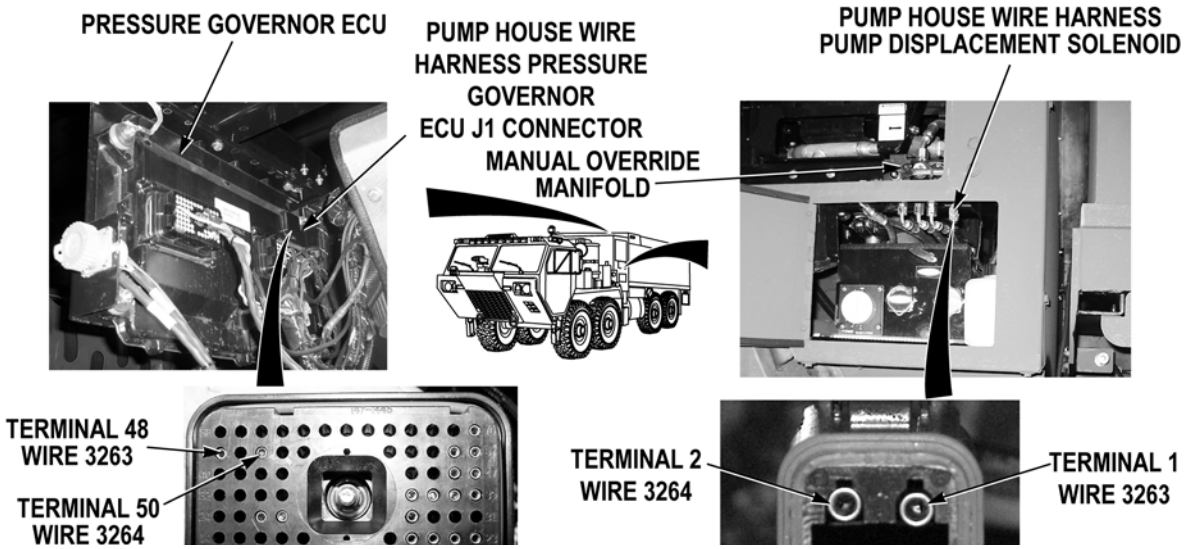
a. If there is continuity, replace hydraulic reservoir fluid level switch (WP 0144).

b. If there is no continuity, repair wire 3269 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

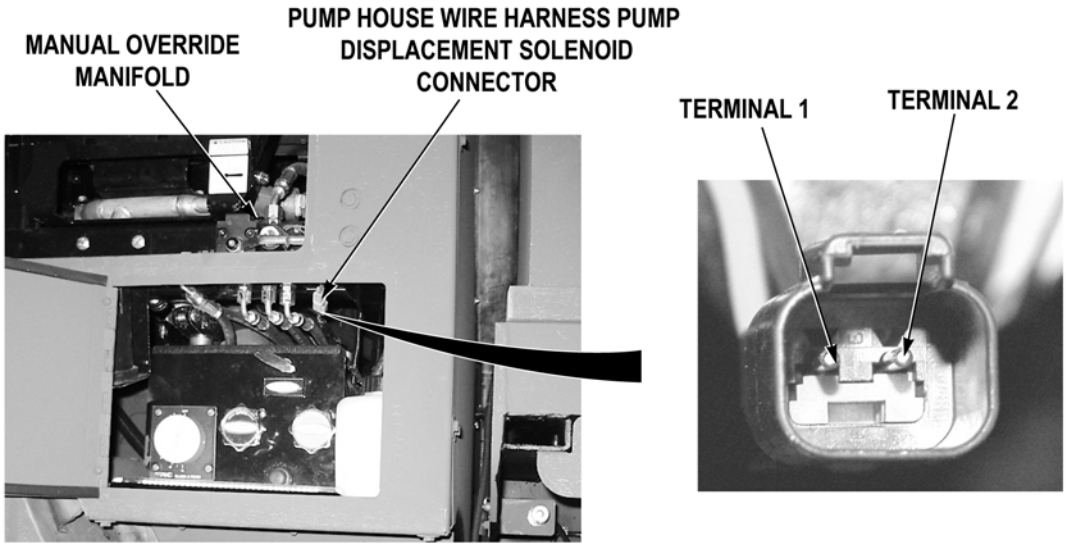
Step 15. Open pump house access door assembly (WP 0008). Disconnect pump house wire harness manual override manifold pump displacement solenoid connector. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3263 (green) from pump house wire harness manual override manifold pump displacement solenoid connector, terminal 1 to pump house wire harness pressure governor ECU J1 connector, terminal 48.

If there is no continuity, repair wire 3263 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 16. With a test lead set, check for continuity across pump house wire harness wire 3264 (black) from pump house wire harness manual override manifold pump displacement solenoid connector, terminal 2 to pump house wire harness pressure governor ECU J1 connector, terminal 50.

If there is no continuity, repair wire 3264 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

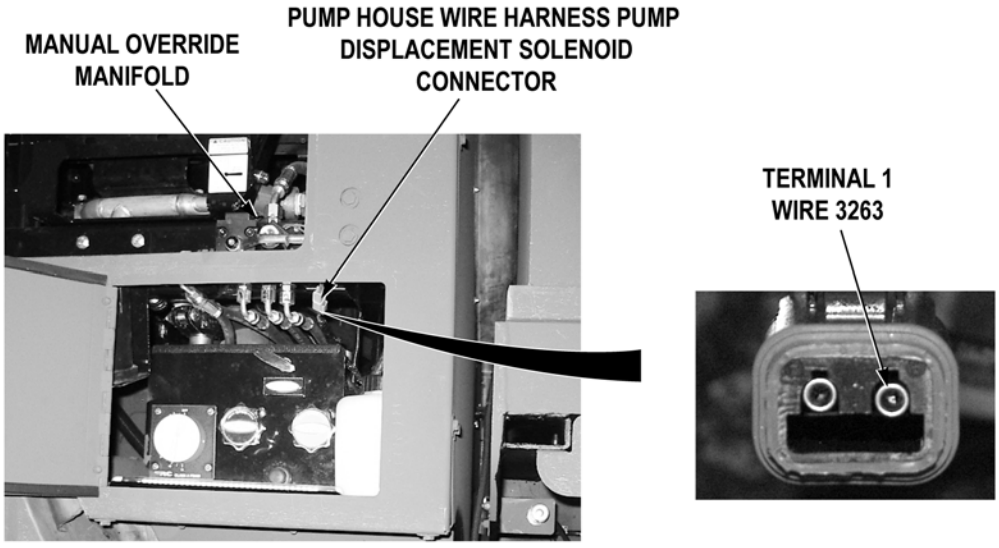


Step 17. With a test lead set, check for 20 to 25 ohms resistance across manual override manifold pump displacement solenoid from manual override manifold pump displacement solenoid connector, terminal 1 to terminal 2.

a. If there is 20 to 25 ohm resistance across manual override manifold pump displacement solenoid, replace pressure governor ECU (WP 0289).

b. If there is not 20 to 25 ohms resistance across manual override manifold pump displacement solenoid, replace hydraulic override manifold (WP 0140).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

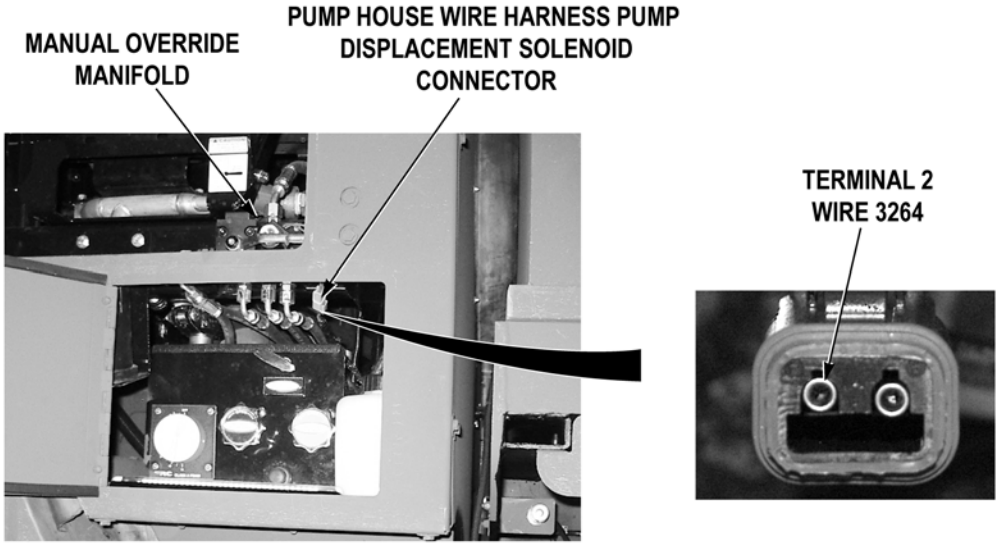
NOTE

A short to ground is present in system. Steps 18 and 19 will isolate fault to a single wire or a component.

Step 18. Pull battery disconnect switch to off position (WP 0007). Open pump house access door assembly (WP 0009). Disconnect pump house wire harness manual override manifold pump displacement solenoid connector. Remove pump house panel K (WP 0341). Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity between pump house wire harness wire 3263 (green) from pump house wire harness manual override manifold pump displacement solenoid connector, terminal 1 to a known good ground.

If there is continuity, repair wire 3263 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

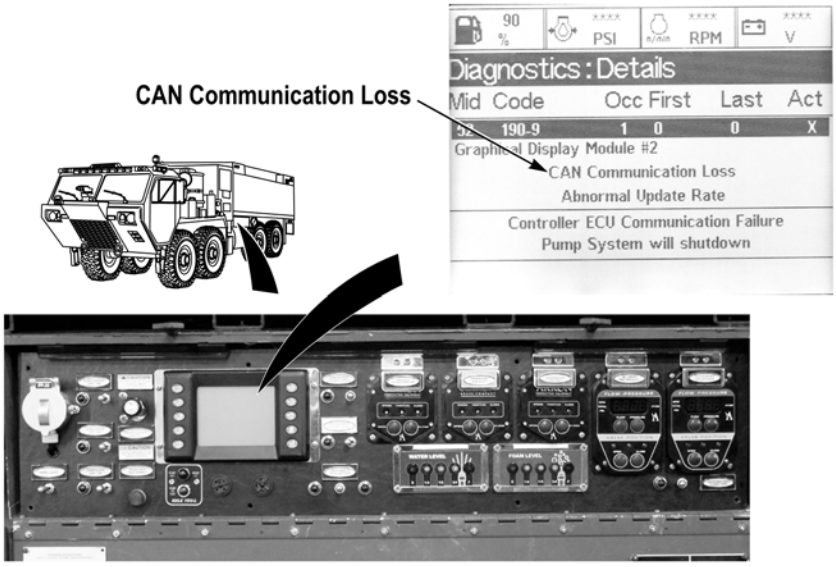


Step 19. With a test lead set, check for continuity between pump house wire harness wire 3264 (black) from pump house wire harness manual override manifold pump displacement solenoid connector, terminal 2 to a known good ground.

a. If there is continuity, repair wire 3264 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity between wire 3264 and a known good ground, replace hydraulic override manifold (WP 0140).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

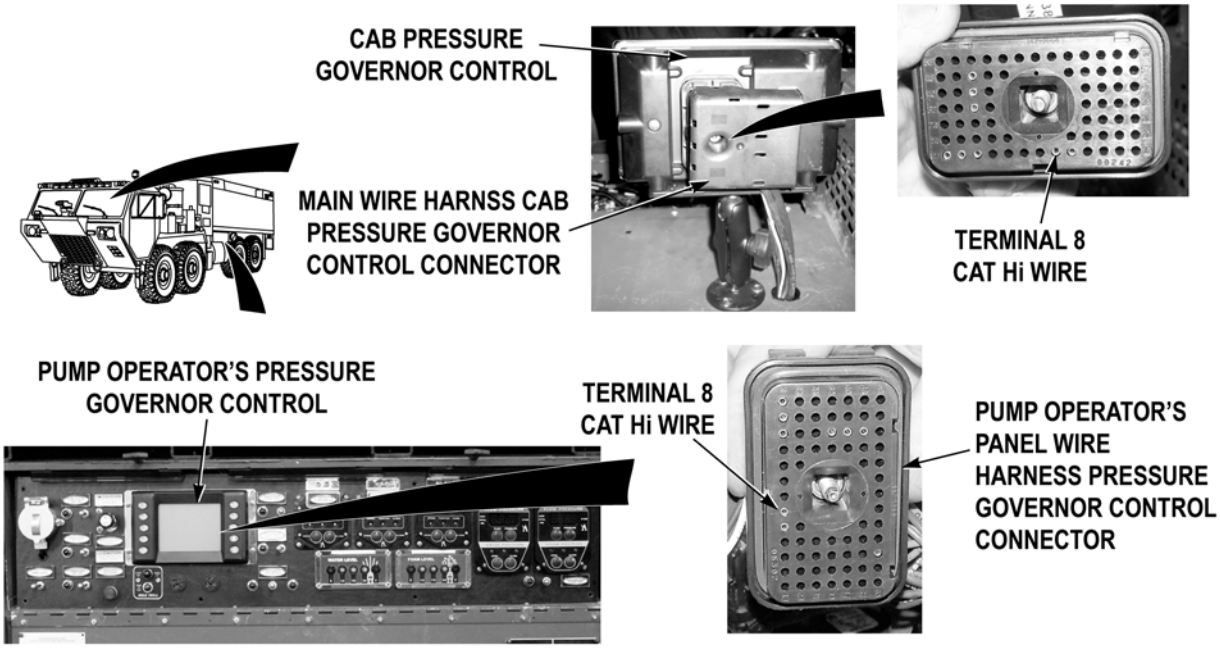
NOTE

CAT datalink wire harness is banded with yellow heat shrink at each connector. CAN datalink wire harness is banded with green heat shrink at each connector.

Step 20. With recorded warning fault(s), check if CAN Communication Loss is displayed.

If CAN Communication Loss is displayed, go to Step 35.

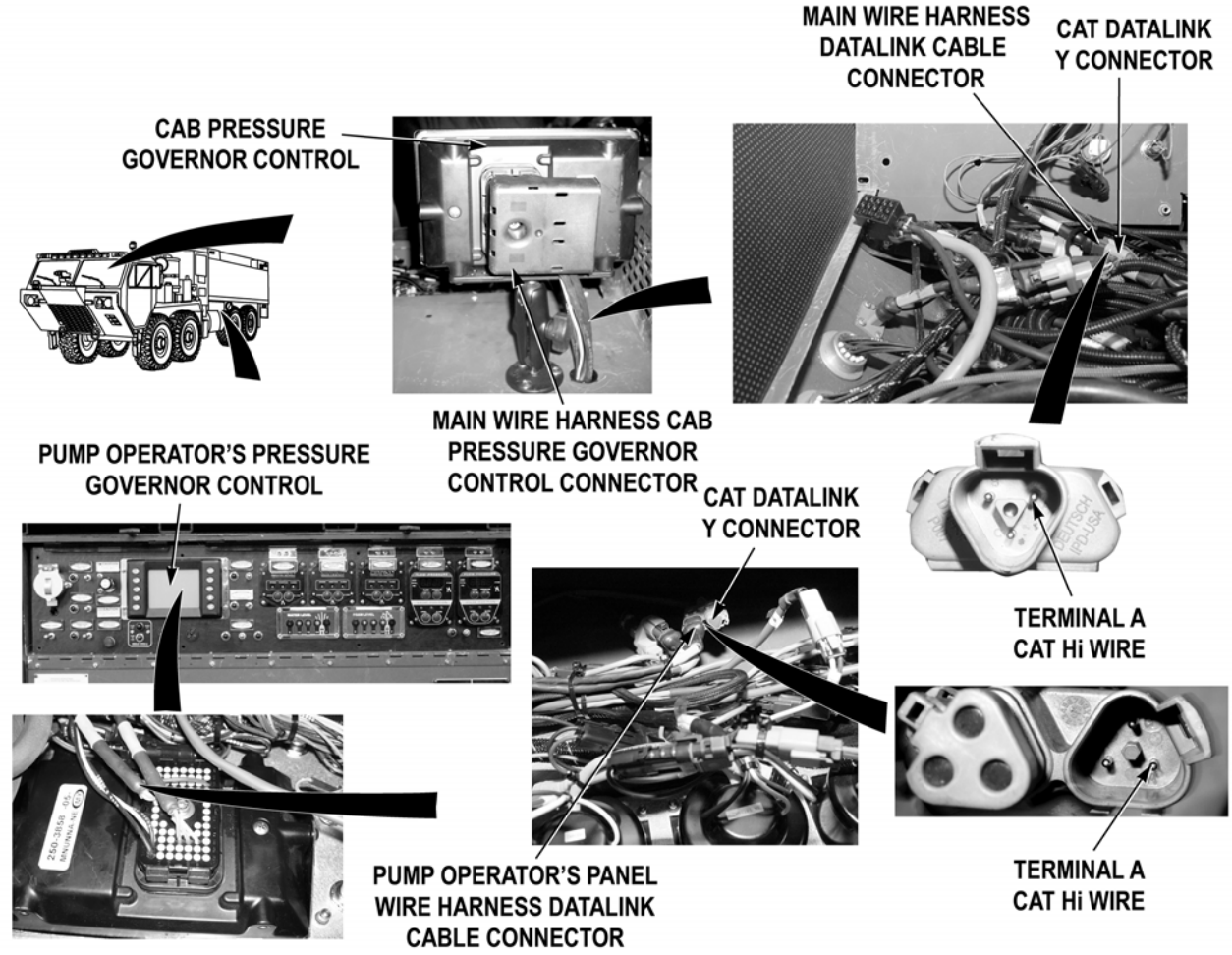
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 21. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness pressure governor control connector. Disconnect main wire harness cab pressure governor control connector. With a test lead set, check for continuity across CAT Hi wire (yellow) from main wire harness cab pressure governor control connector, terminal 8 to pump operator's panel wire harness pressure governor control connector, terminal 8.

If there is continuity, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



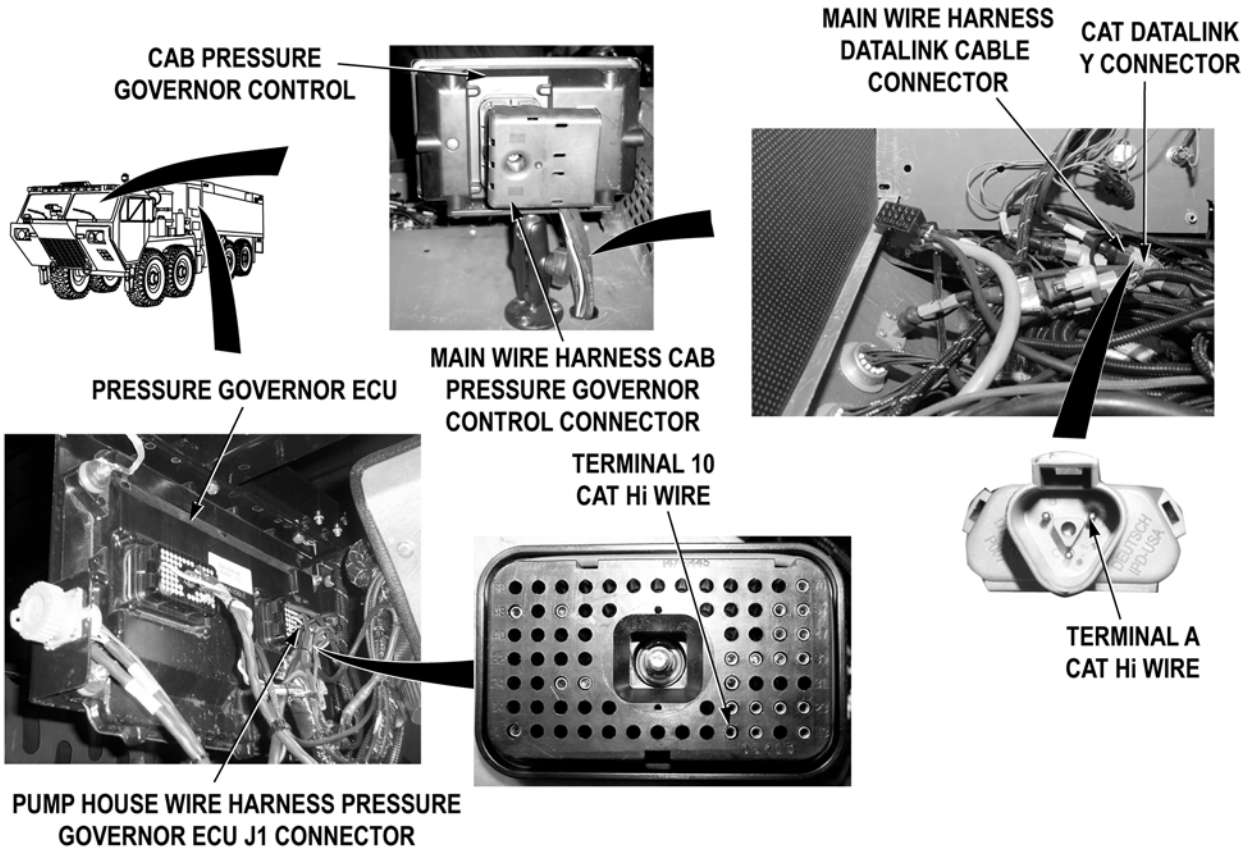
NOTE

- To locate correct datalink cable connector in cab, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.
- To locate correct datalink cable connector in pump operator's panel, follow yellow banded datalink cable from pump operator's panel pressure governor control connector to first Y connector in series.

Step 22. Remove cab instrument panel E (WP 0341). Disconnect main wire harness datalink cable connector from CAT datalink Y connector. Disconnect pump operator's panel wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal A to CAT datalink cable Y connector (that was disconnected from pump operator's panel wire harness), terminal A.

If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

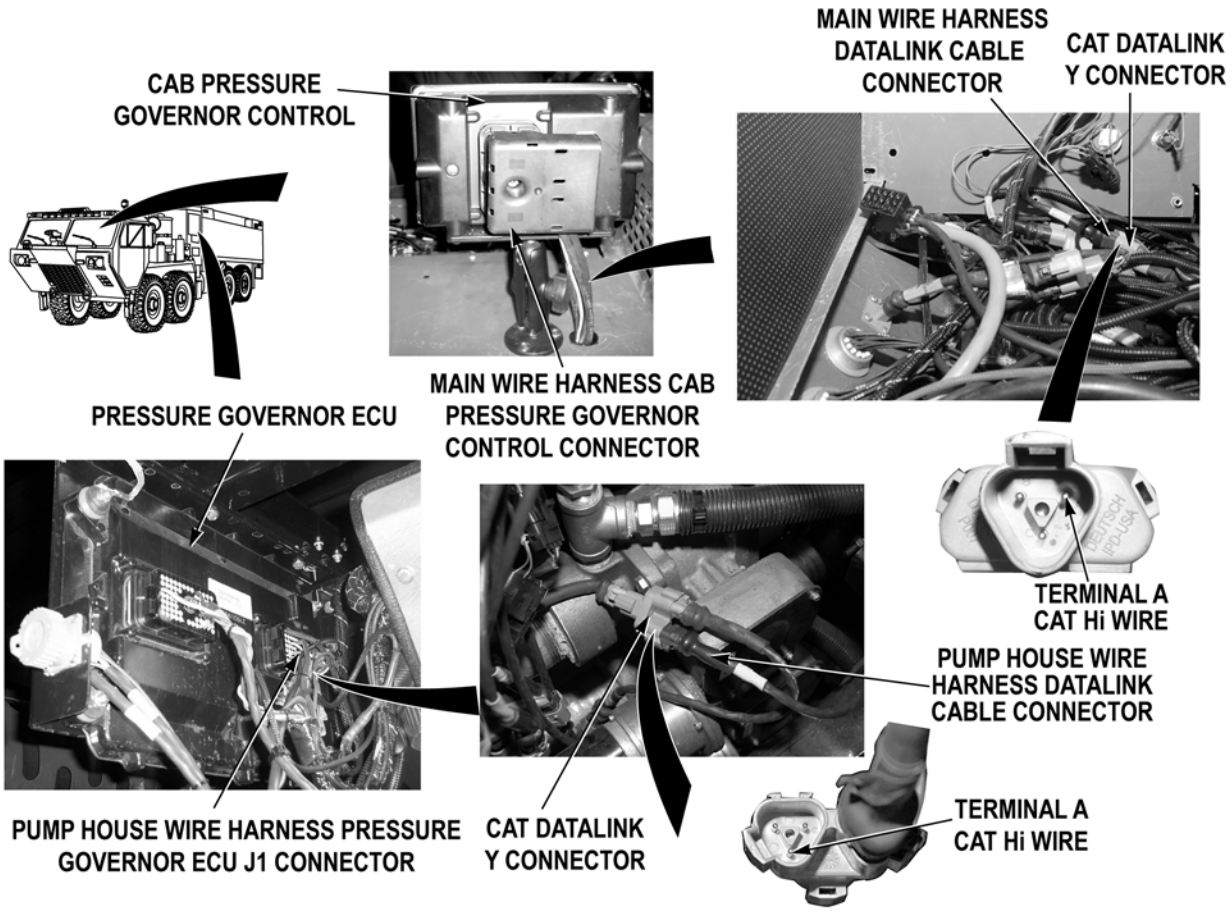
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 23. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal A to pump house wire harness pressure governor ECU J1 connector, terminal 10.

If there is continuity, go to Step 25.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

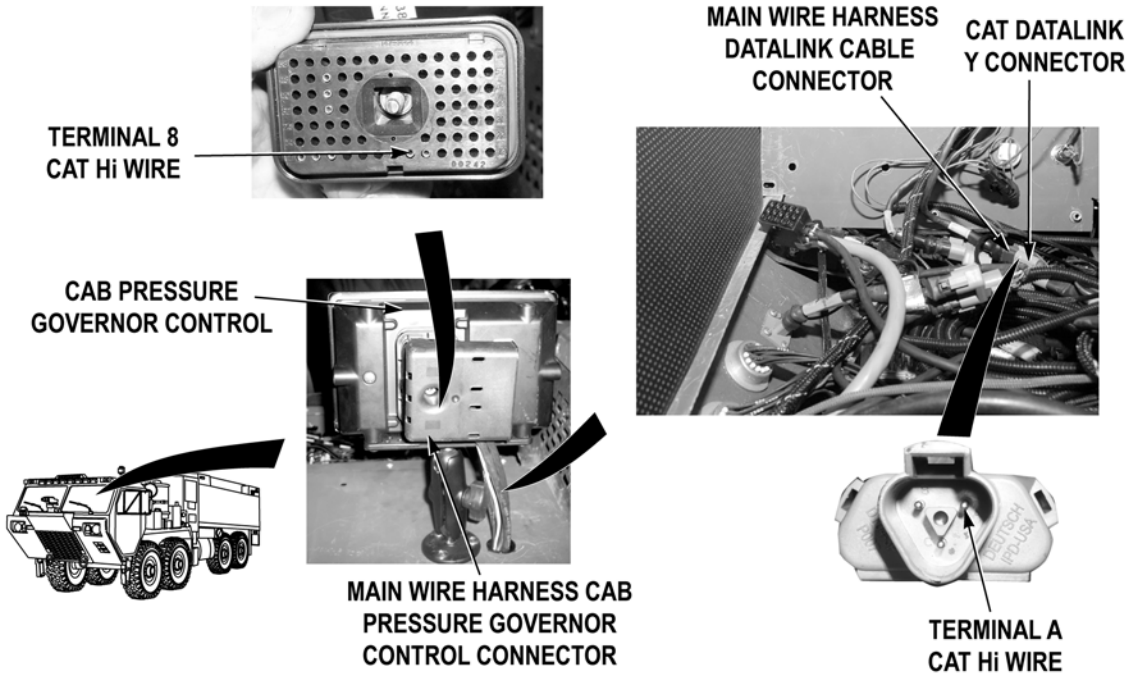
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 24. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal A to CAT datalink cable Y connector (that was disconnected from main wire harness), terminal A.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

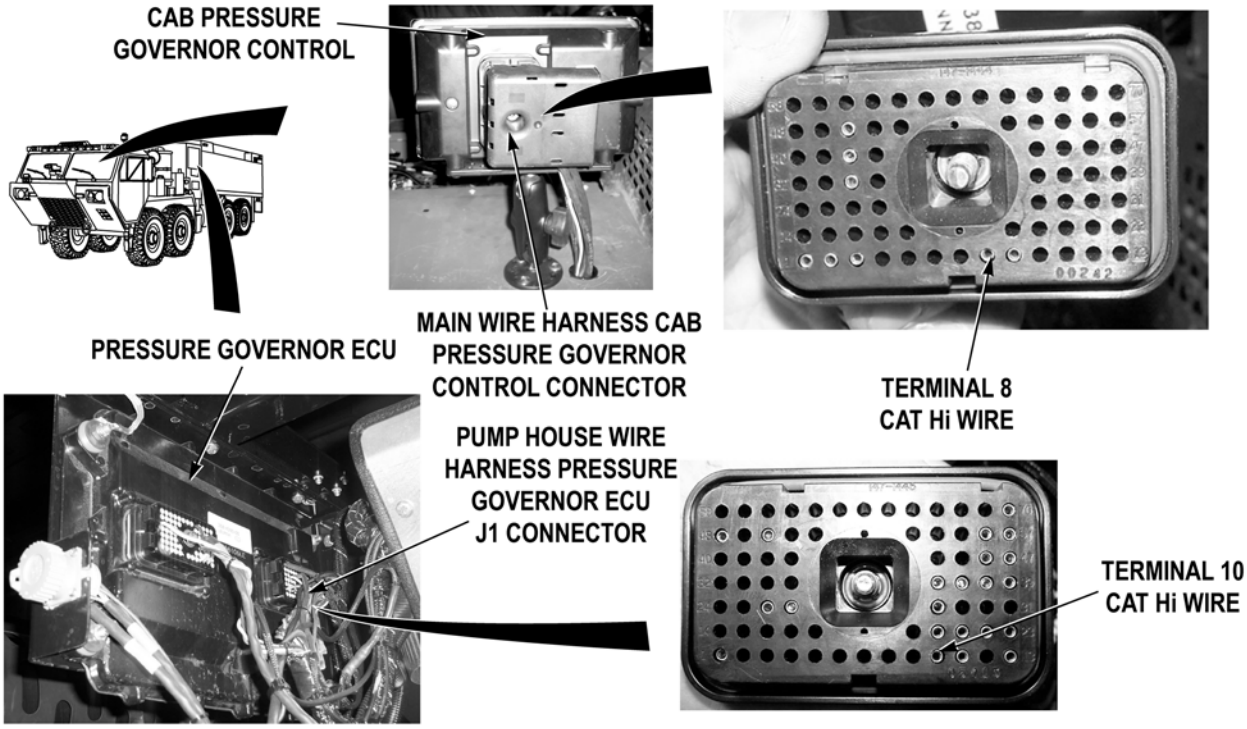


Step 25. With a test lead set, check for continuity across main wire harness CAT Hi wire (yellow) from cab pressure governor control connector, terminal 8 to main wire harness datalink cable connector, terminal A.

a. If there is continuity, repair pump operator's panel datalink cable if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair main wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



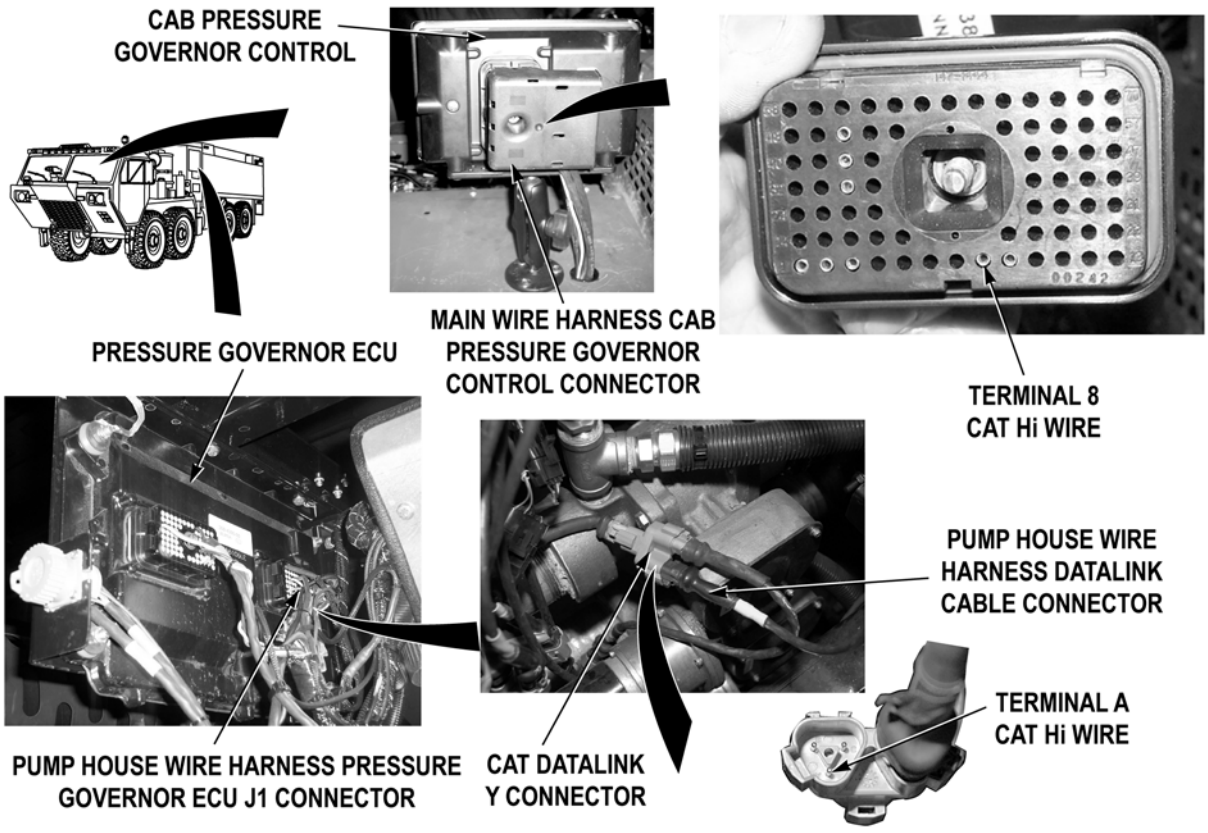
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 26. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across CAT Hi wire (yellow) from main wire harness cab pressure governor control connector, terminal 8 to pump house wire harness pressure governor ECU J1 connector, terminal 10.

If there is continuity, go to Step 28.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

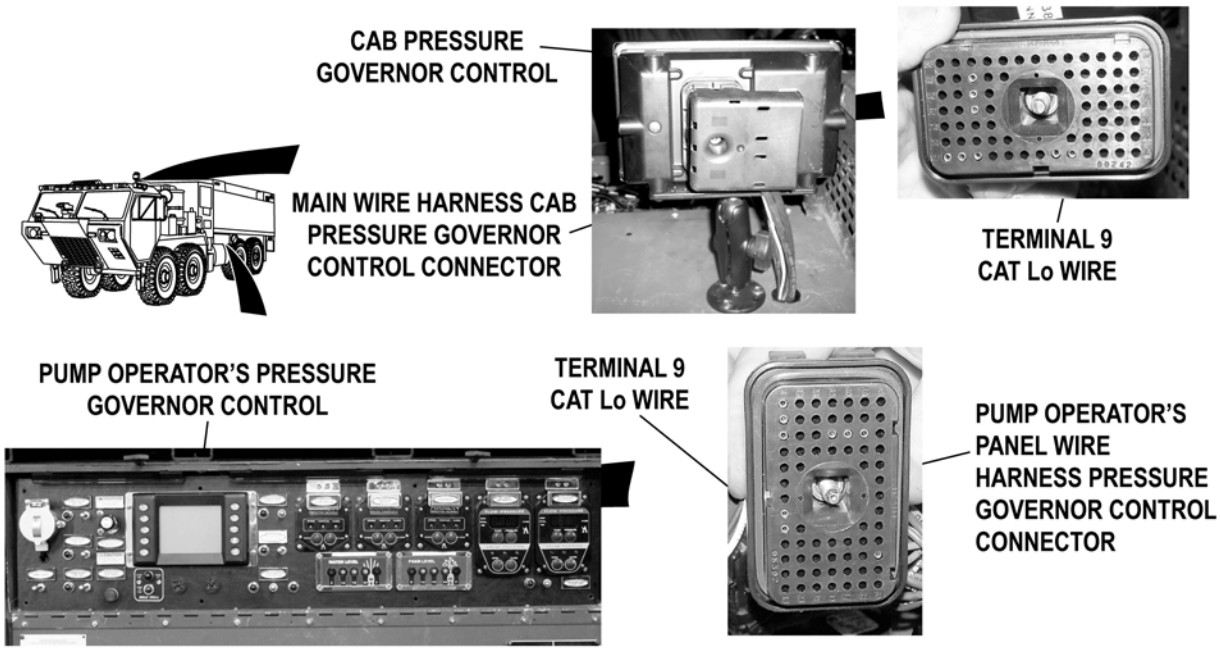
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 27. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal A to main wire harness cab pressure governor control connector, terminal 8.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

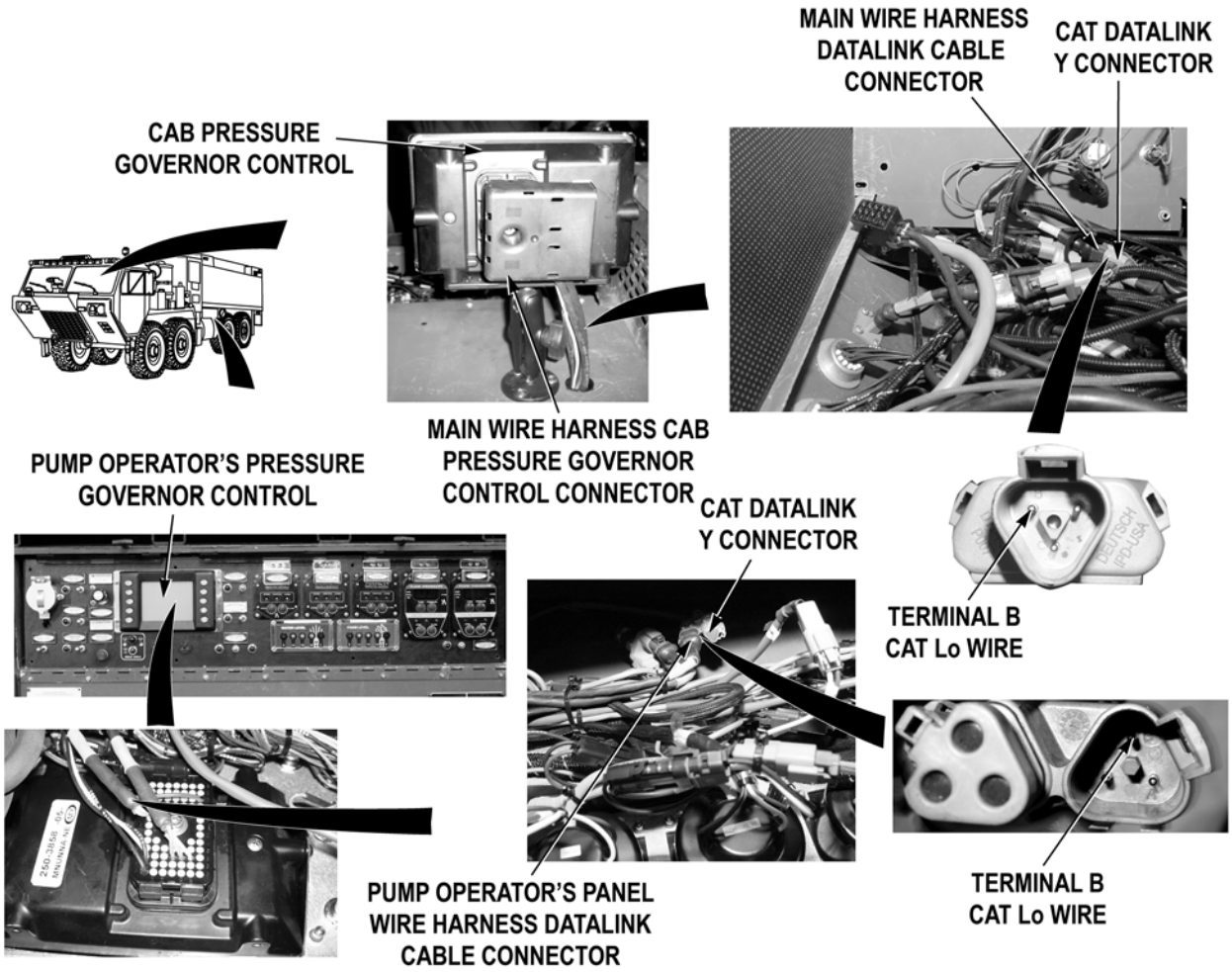
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 28. With a test lead set, check for continuity across CAT Lo wire (green) from main wire harness cab pressure governor control connector, terminal 9 to pump operator's panel pressure governor control connector, terminal 9.

If there is continuity, go to Step 33.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



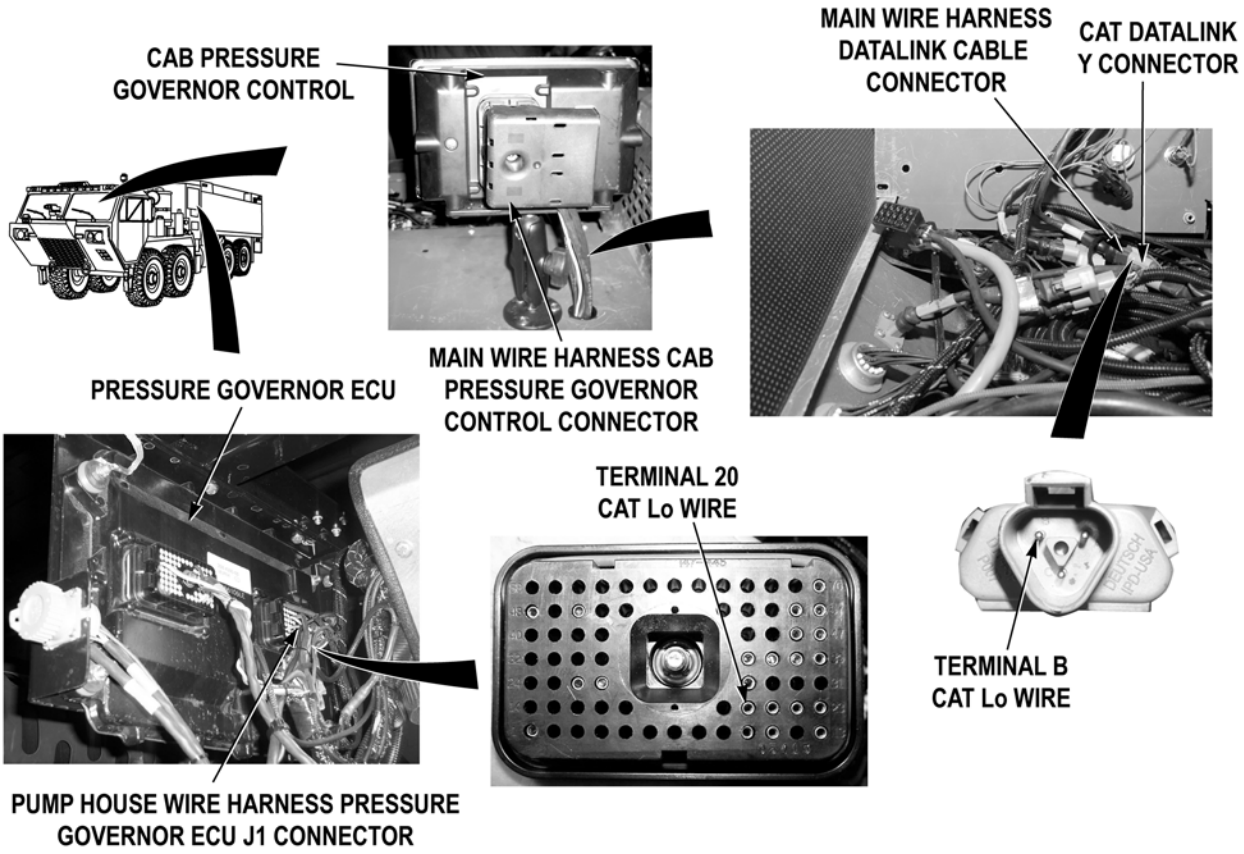
NOTE

- To locate correct datalink cable connector in cab, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.
- To locate correct datalink cable connector in pump operator's panel, follow yellow banded datalink cable from pump operator's panel pressure governor control connector to first Y connector in series.

Step 29. Remove cab instrument panel E (WP 0341). Disconnect main wire harness datalink cable connector from CAT datalink Y connector. Disconnect pump operator's panel wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal B to CAT datalink cable Y connector (that was disconnected from pump operator's panel wire harness), terminal B.

If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

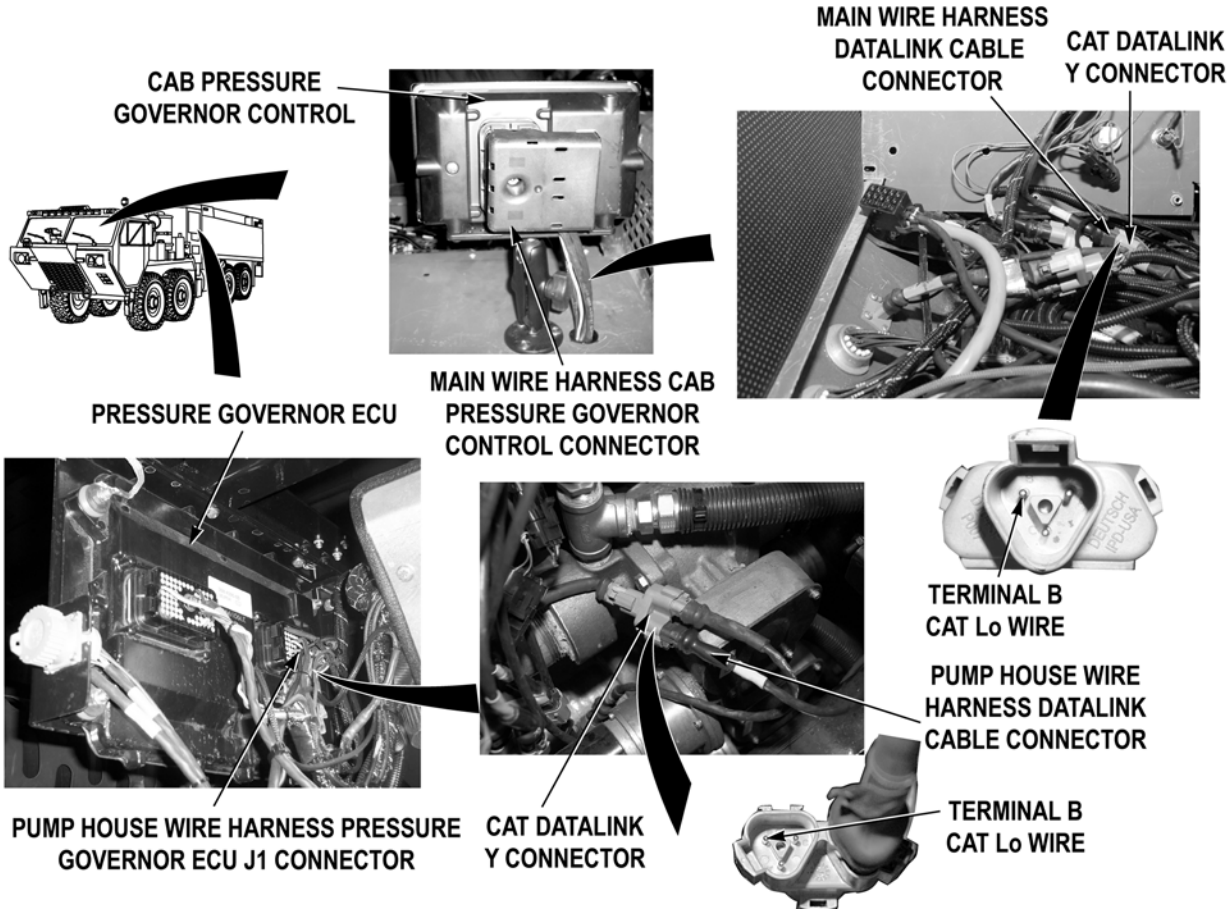
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 30. With a test lead set, check for continuity across CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal B to pump house wire harness pressure governor ECU J1 connector, terminal 20.

If there is continuity, go to Step 32.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

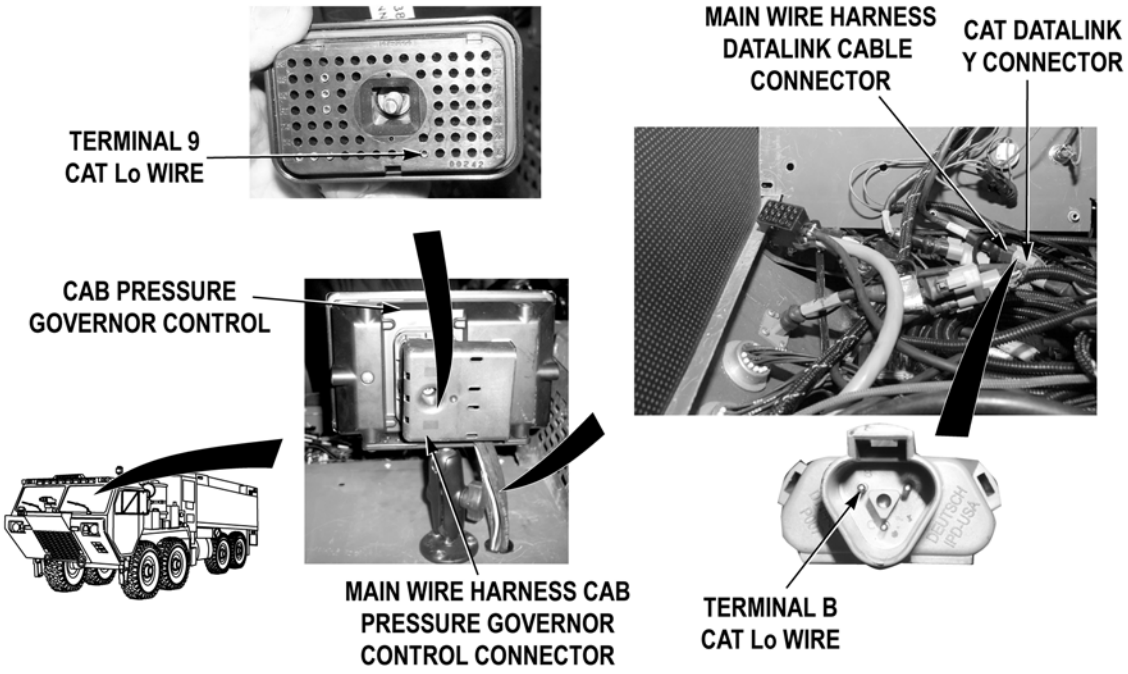
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.

Step 31. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal B to CAT datalink cable Y connector (that was disconnected from main wire harness), terminal B.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

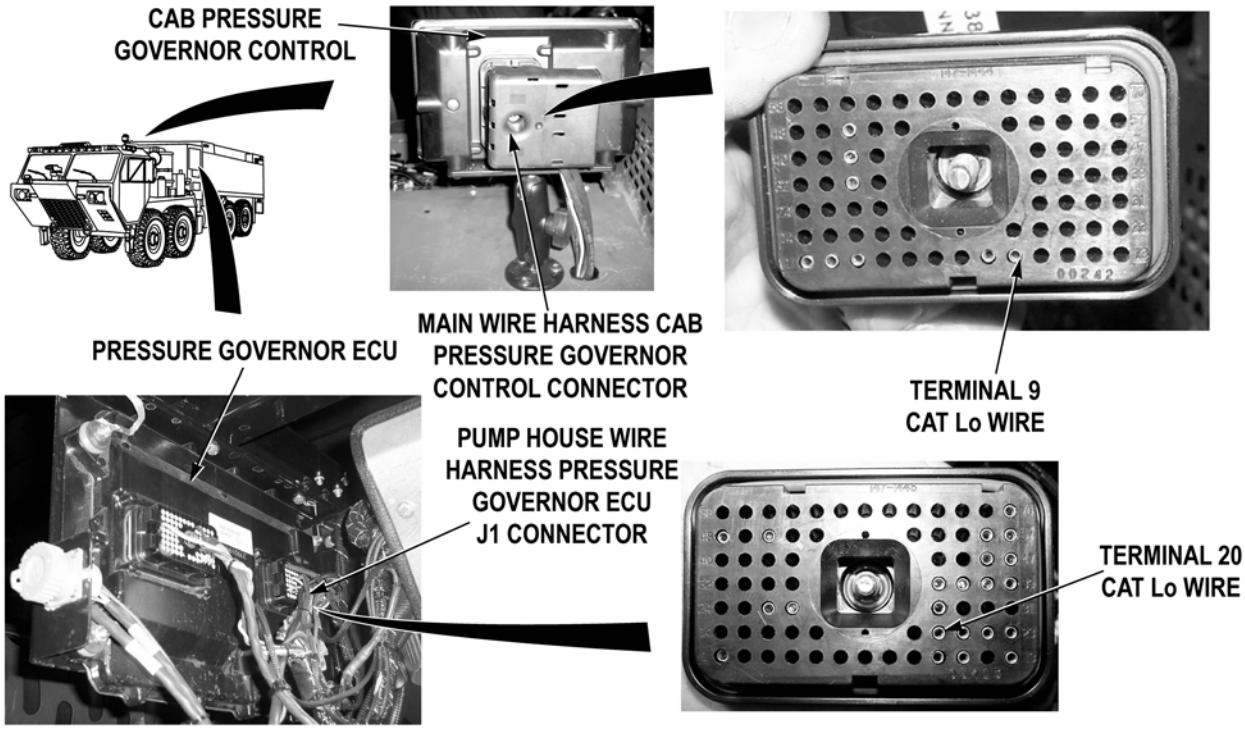


Step 32. With a test lead set, check for continuity across main wire harness CAT Lo wire (green) from cab pressure governor control connector, terminal 9 to main wire harness datalink cable connector, terminal B.

a. If there is continuity, repair pump operator's panel datalink cable if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair main wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



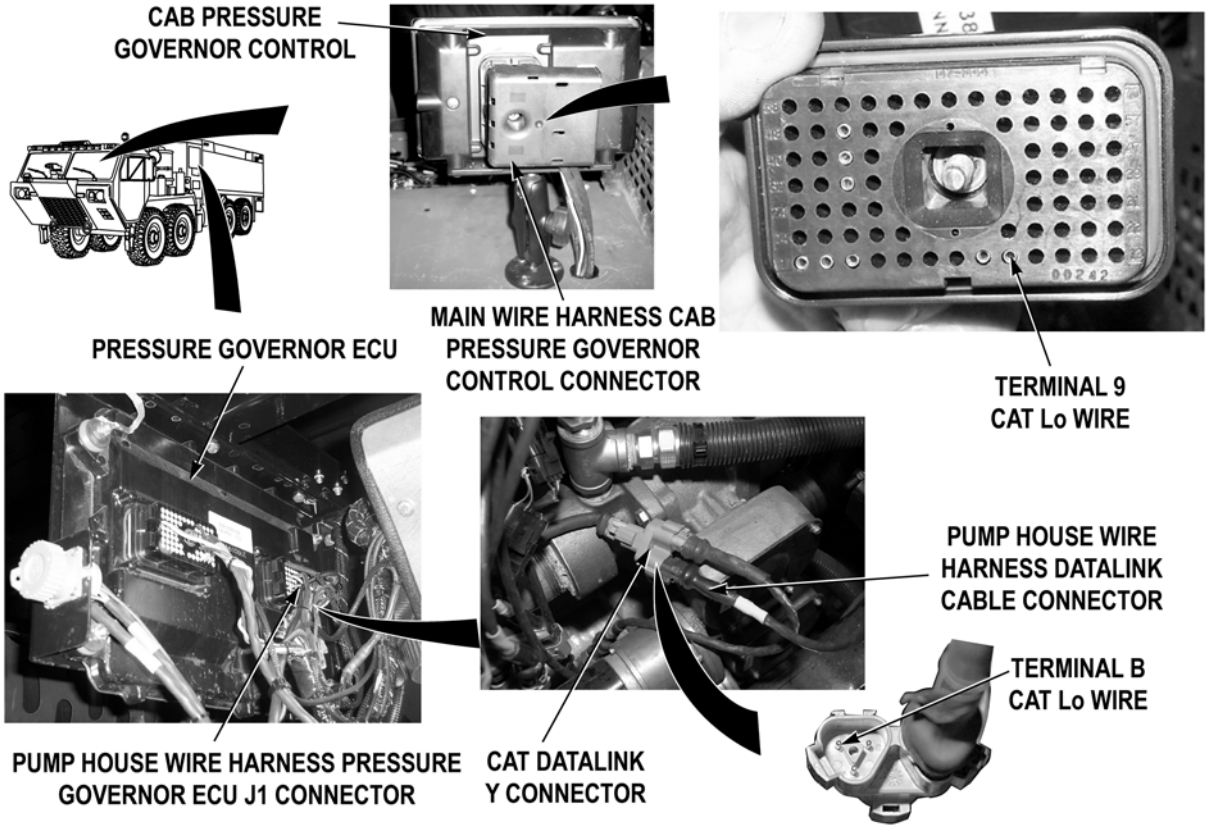
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 33. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across CAT Lo wire (green) from main wire harness cab pressure governor control connector, terminal 9 to pump house wire harness pressure governor ECU J1 connector, terminal 20.

If there is continuity, replace pressure governor ECU (WP 0289).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

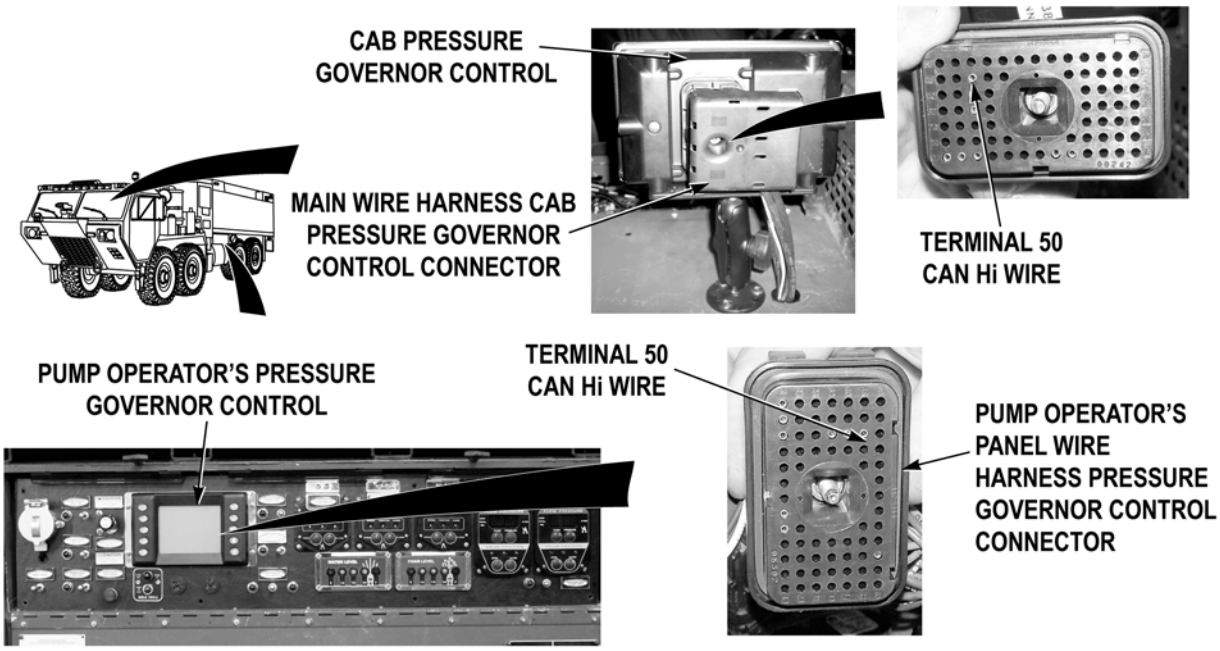
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.

Step 34. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal B to main wire harness cab pressure governor control connector, terminal 9.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

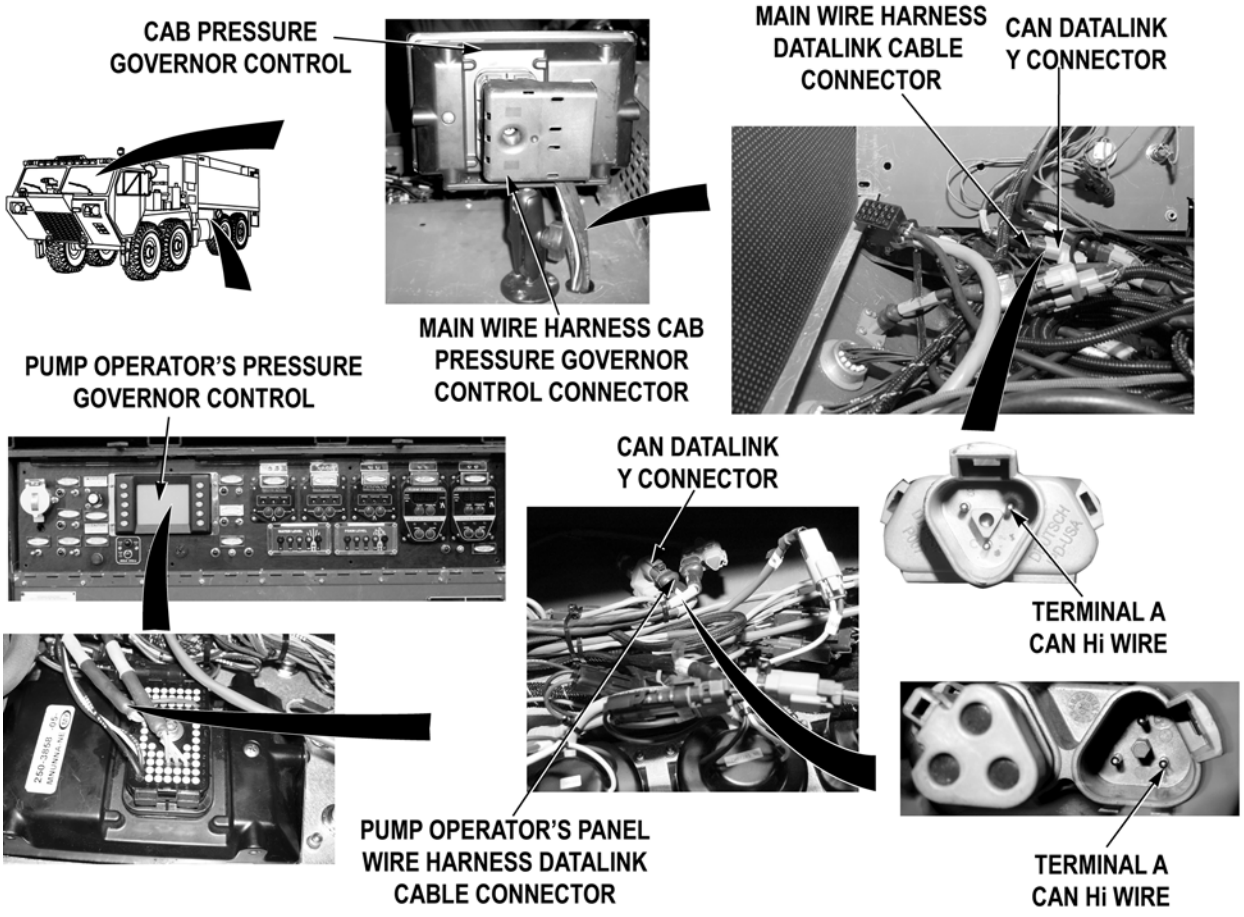
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 35. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness pressure governor control connector. Disconnect main wire harness cab pressure governor control connector. With a test lead set, check for continuity across CAN Hi wire (yellow) from main wire harness cab pressure governor control connector, terminal 50 to pump operator's panel wire harness pressure governor control connector, terminal 50.

If there is continuity, go to Step 40.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



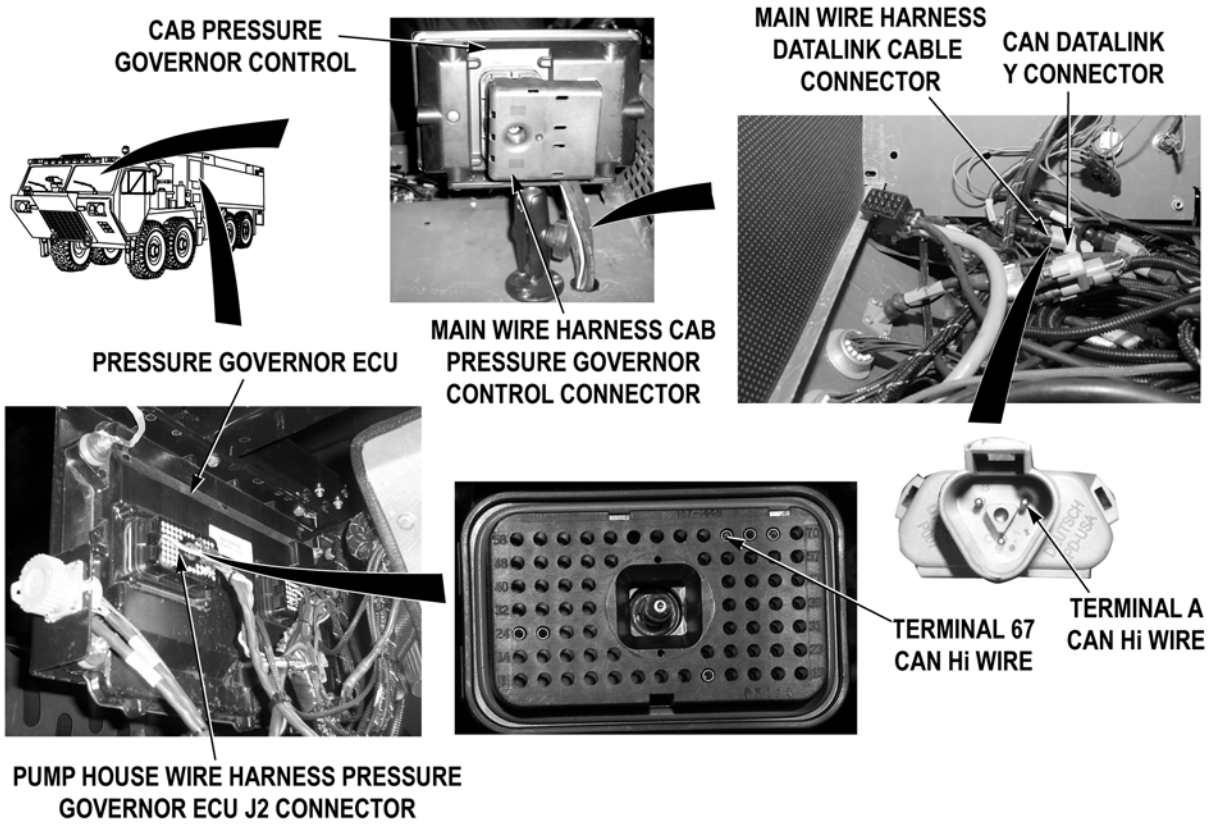
NOTE

- To locate correct datalink cable connector in cab, follow green banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.
- To locate correct datalink cable connector in pump operator's panel, follow green banded datalink cable from pump operator's panel pressure governor control connector to first Y connector in series.

Step 36. Remove cab instrument panel E (WP 0341). Disconnect main wire harness datalink cable connector from CAN datalink Y connector. Disconnect pump operator's panel wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Hi wire (yellow) from CAN datalink cable Y connector (that was disconnected from main wire harness), terminal A to CAN datalink cable Y connector (that was disconnected from pump operator's panel wire harness), terminal A.

If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

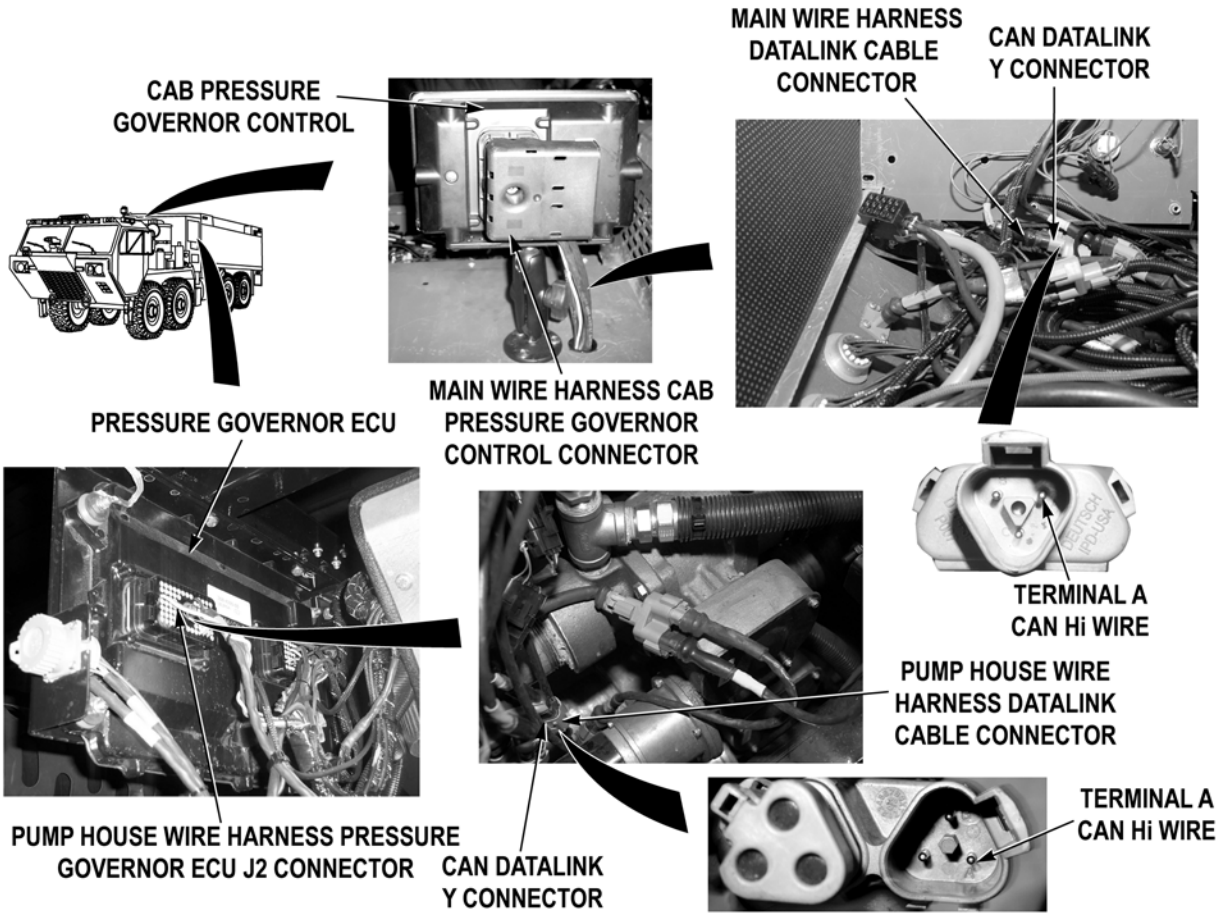
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 37. Disconnect pump house wire harness pressure governor ECU J2 connector. With a test lead set, check for continuity across CAN Hi wire (yellow) from CAN datalink cable Y connector (that was disconnected from main wire harness), terminal A to pump house wire harness pressure governor ECU J2 connector, terminal 67.

If there is continuity, go to Step 39.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

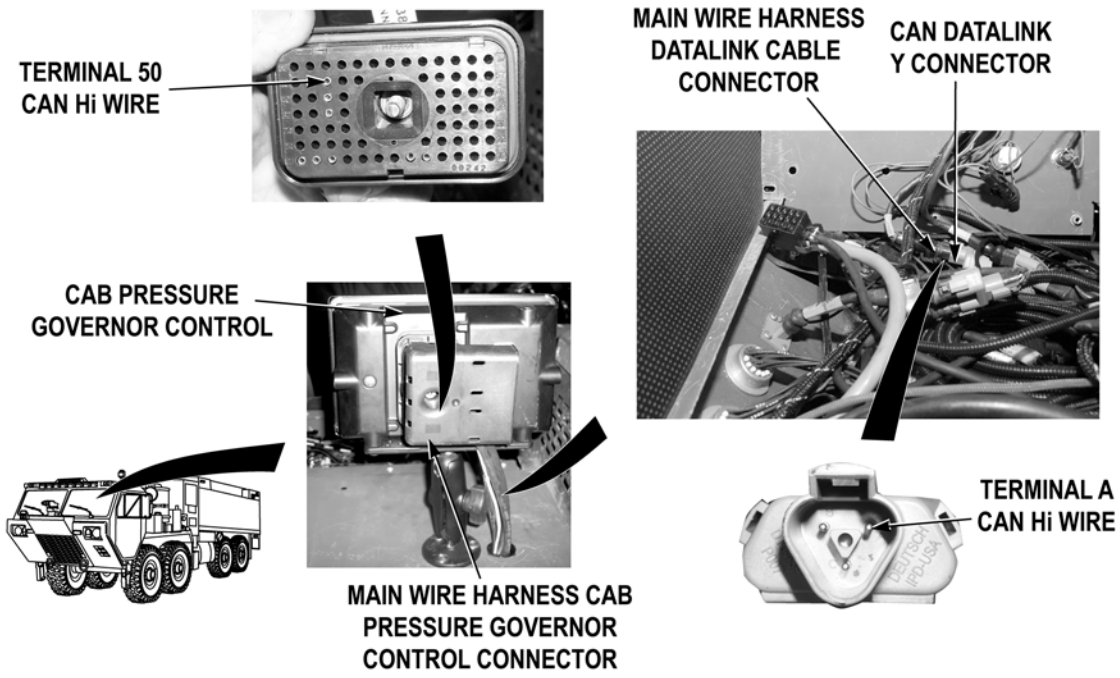
To locate correct datalink cable connector in pump house, follow green banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 38. Disconnect pump house wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Hi wire (yellow) from CAN datalink cable Y connector (that was disconnected from pump house wire harness), terminal A to CAN datalink cable Y connector (that was disconnected from main wire harness), terminal A.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

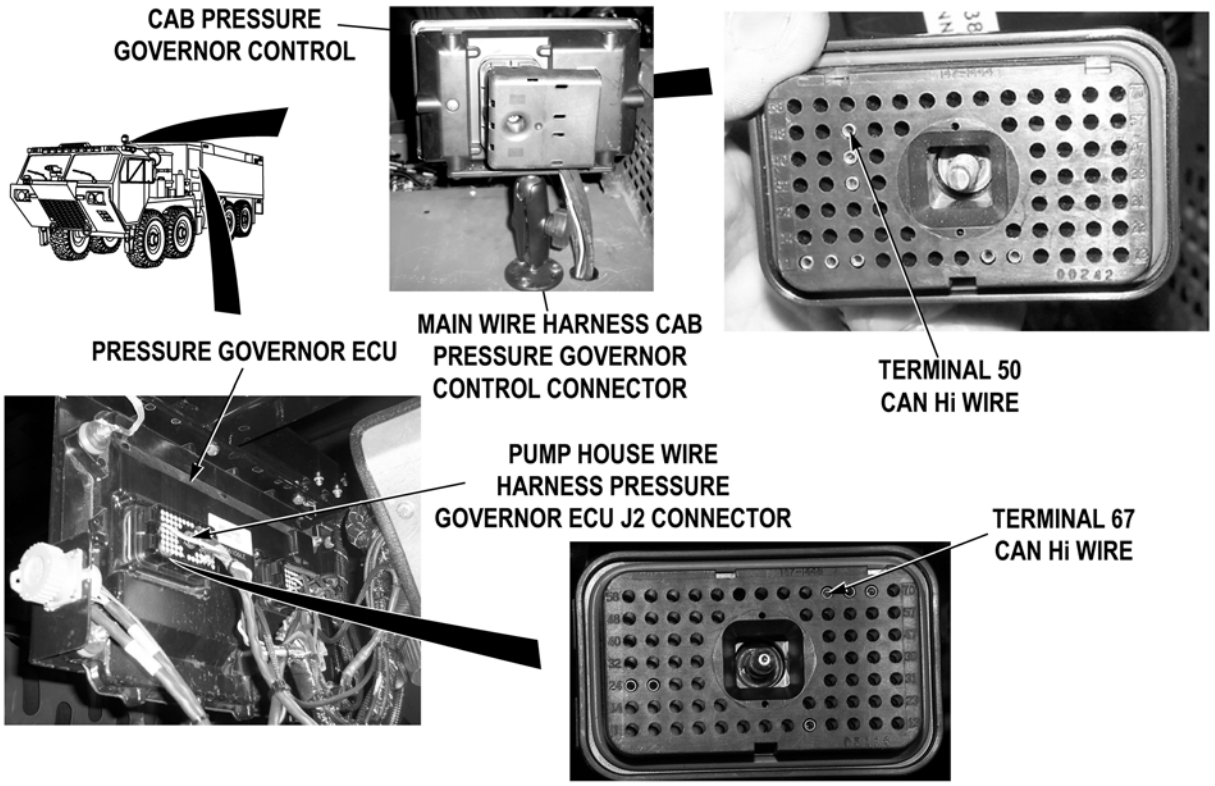


Step 39. Check for continuity across main wire harness CAN Hi wire (yellow) from cab pressure governor control connector, terminal 50 to main wire harness datalink cable connector, terminal A.

a. If there is continuity, repair pump operator's panel datalink cable if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair main wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

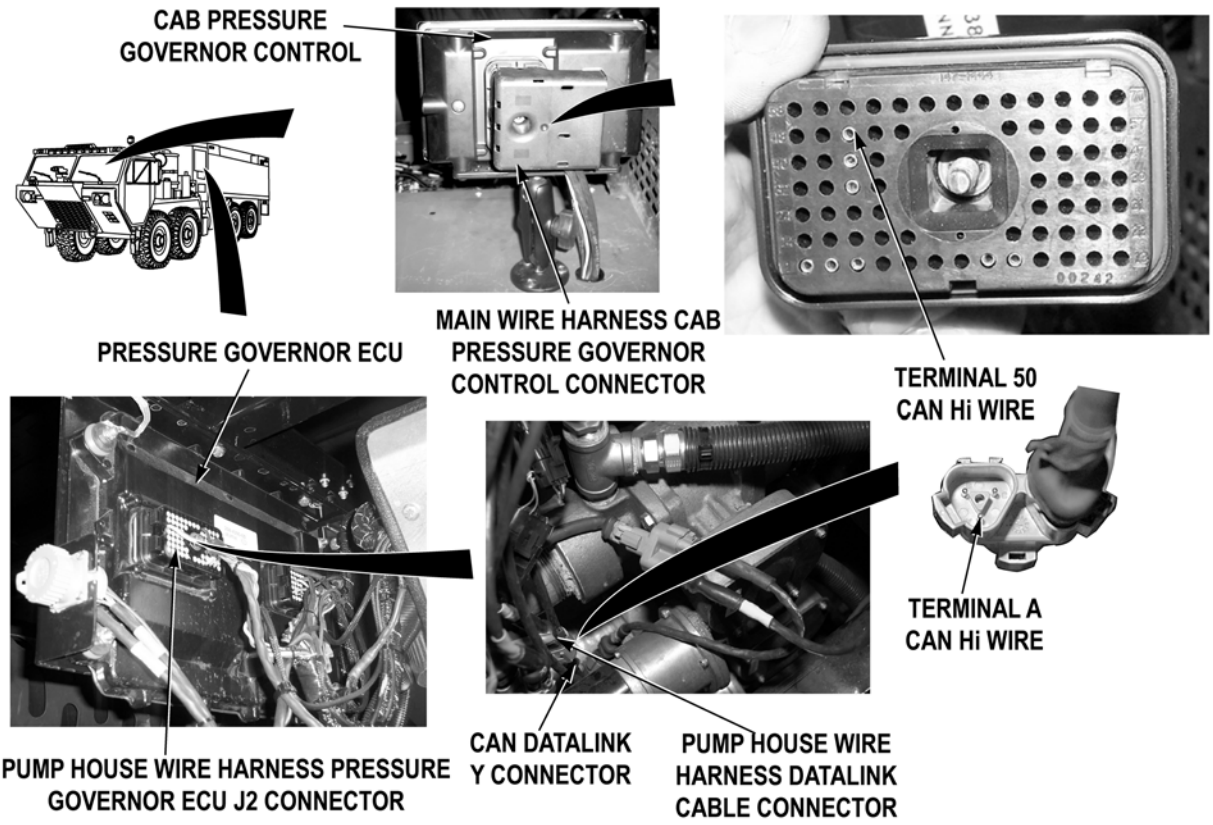
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 40. Disconnect pump house wire harness pressure governor ECU J2 connector. With a test lead set, check for continuity across CAN Hi wire (yellow) from main wire harness cab pressure governor control connector, terminal 50 to pump house wire harness pressure governor ECU J2 connector, terminal 67.

If there is continuity, go to Step 42.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

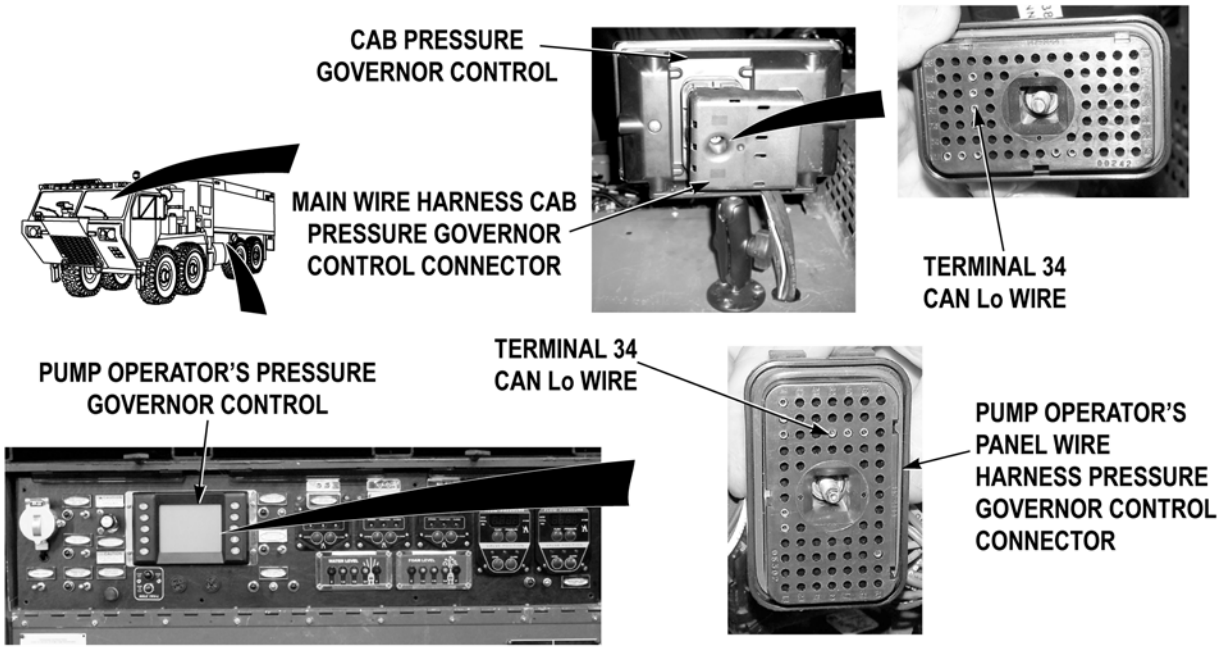
To locate correct datalink cable connector in pump house, follow green banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 41. Disconnect pump house wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Hi wire (yellow) from CAN datalink cable Y connector (that was disconnected from pump house wire harness), terminal A to main wire harness cab pressure governor control connector, terminal 50.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

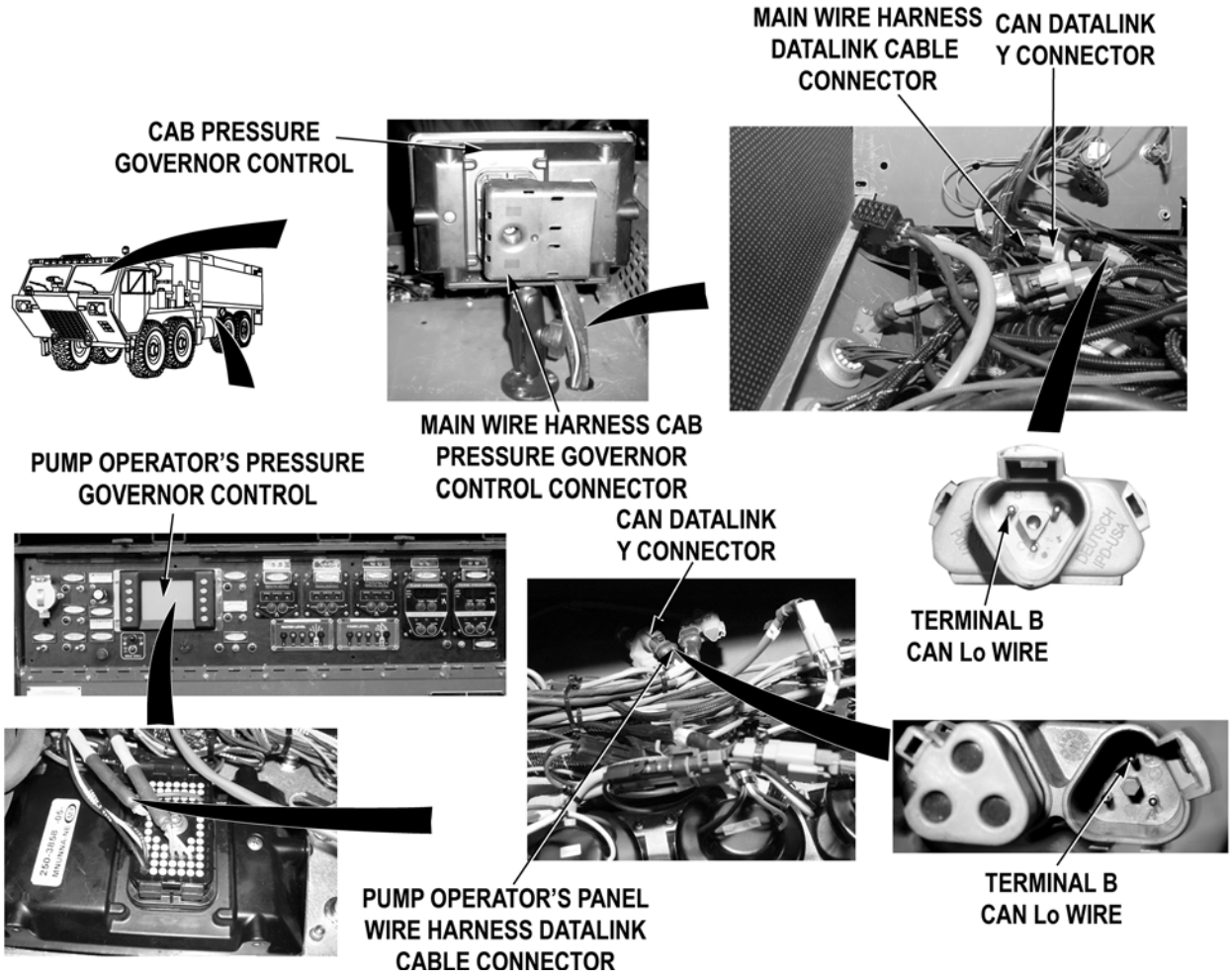
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 42. With a test lead set, check for continuity across CAN Lo wire (green) from main wire harness cab pressure governor control connector, terminal 34 to pump operator's panel pressure governor control connector, terminal 34.

If there is continuity, go to Step 47.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



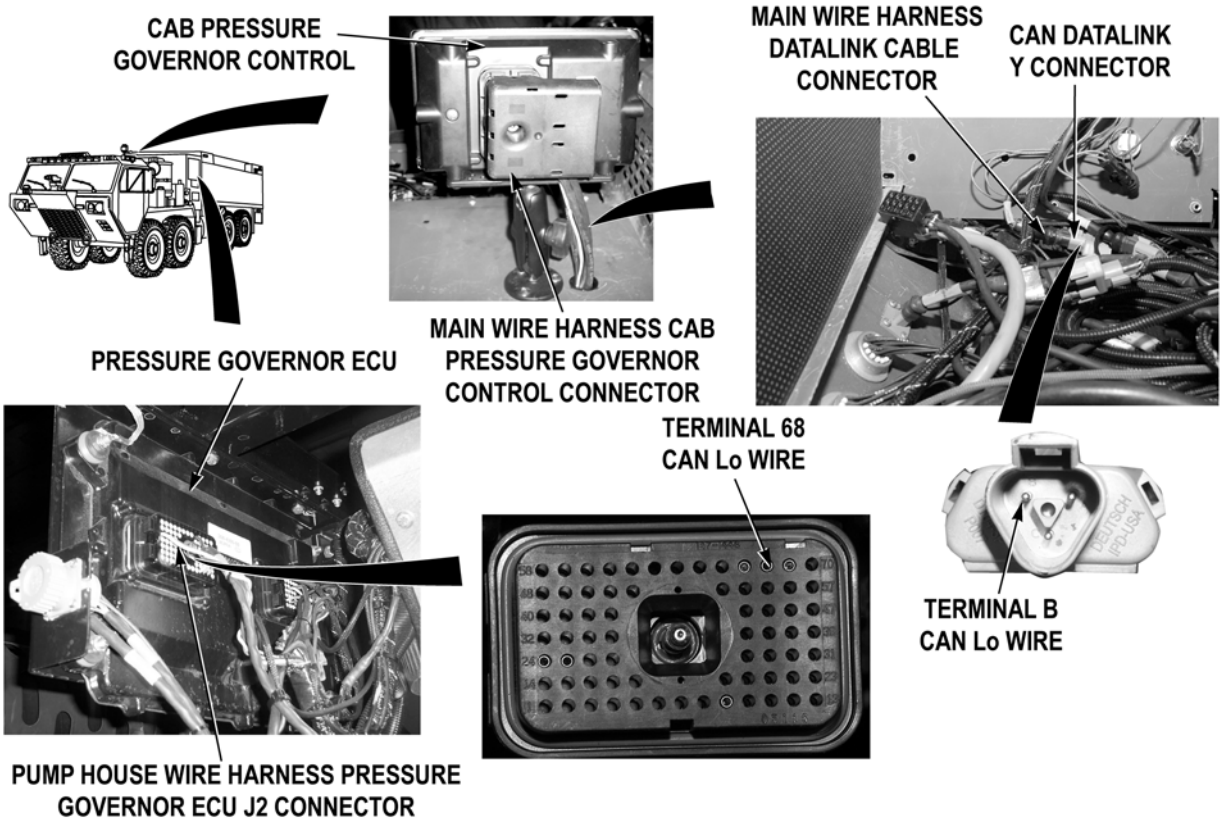
NOTE

- To locate correct datalink cable connector in cab, follow green banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.
- To locate correct datalink cable connector in pump operator's panel, follow green banded datalink cable from pump operator's panel pressure governor control connector to first Y connector in series.

Step 43. Remove cab instrument panel E (WP 0341). Disconnect main wire harness datalink cable connector from CAN datalink Y connector. Disconnect pump operator's panel wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Lo wire (green) from CAN datalink cable Y connector (that was disconnected from main wire harness), terminal B to CAN datalink cable Y connector (that was disconnected from pump operator's panel wire harness), terminal B.

If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

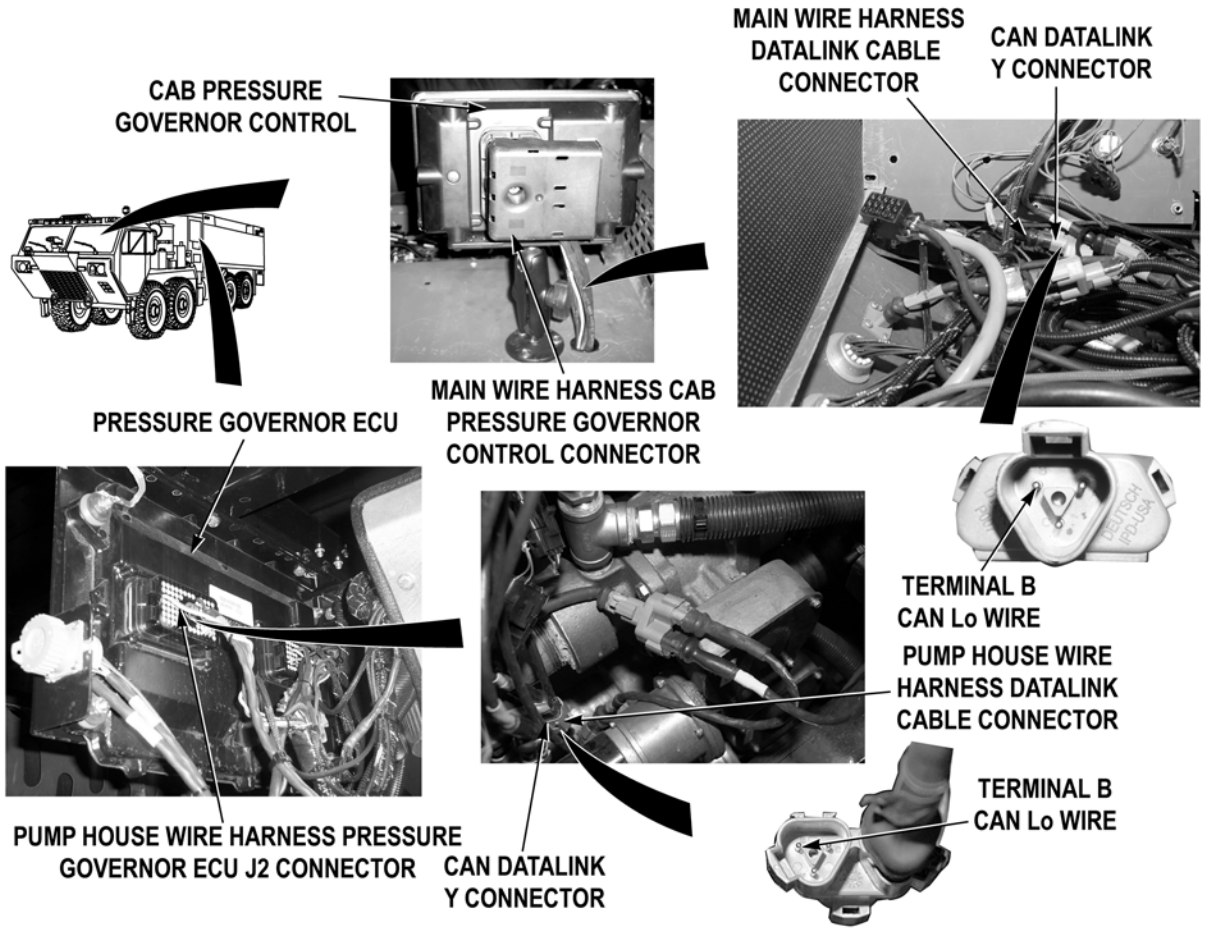
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 44. With a test lead set, check for continuity across CAN Lo wire (green) from CAN datalink cable Y connector (that was disconnected from main wire harness), terminal B to pump house wire harness pressure governor ECU J2 connector, terminal 68.

If there is continuity, go to Step 46.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

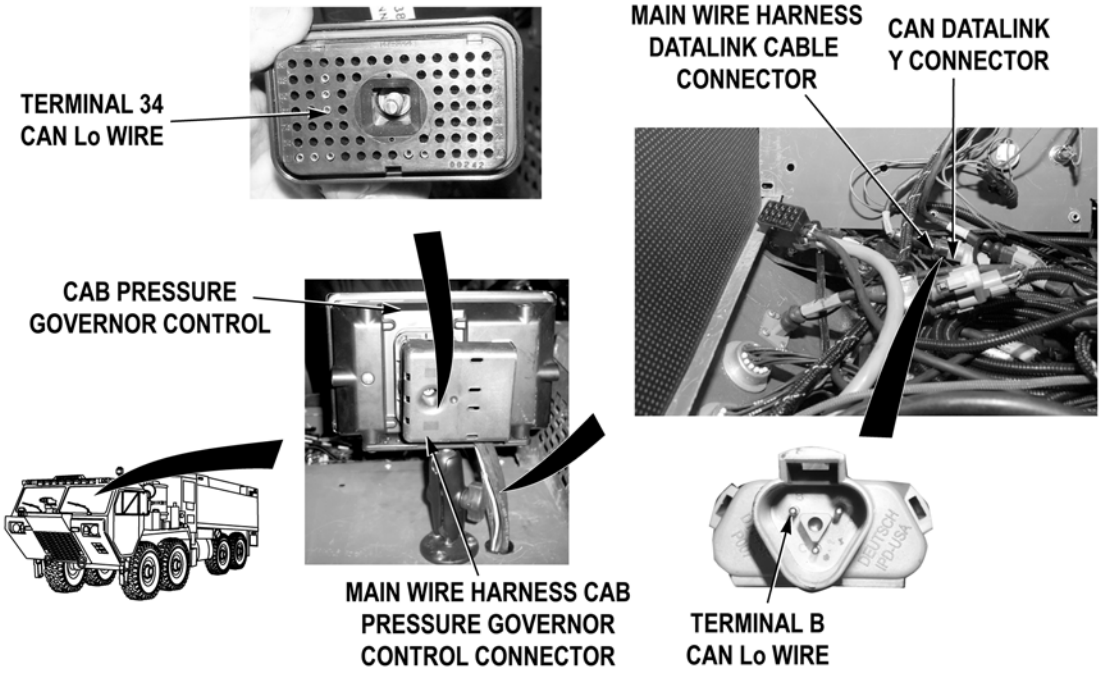
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 45. Disconnect pump house wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Lo wire (green) from CAN datalink cable Y connector (that was disconnected from pump house wire harness), terminal B to CAN datalink cable Y connector (that was disconnected from main wire harness), terminal B.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

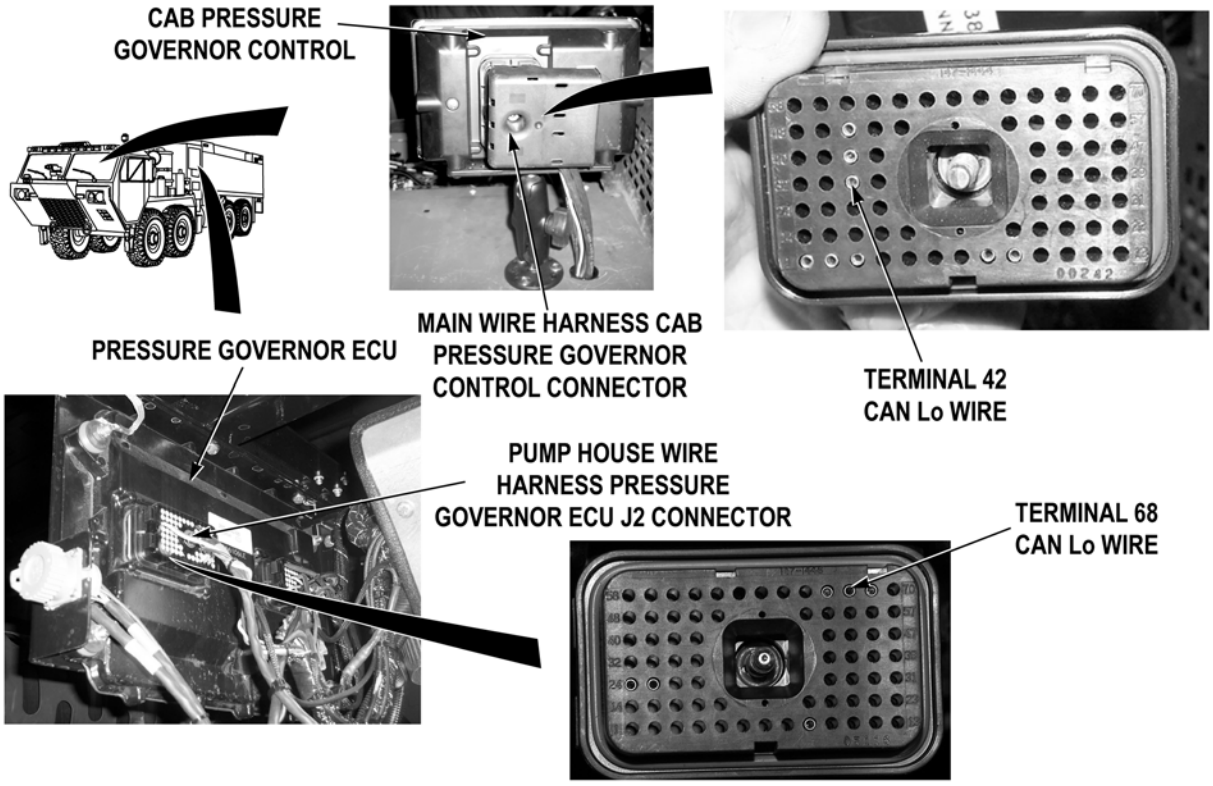


Step 46. With a test lead set, check for continuity across main wire harness CAN Lo wire (green) from cab pressure governor control connector, terminal 34 to main wire harness datalink cable connector, terminal B.

a. If there is continuity, repair pump operator's panel datalink cable if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair main wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

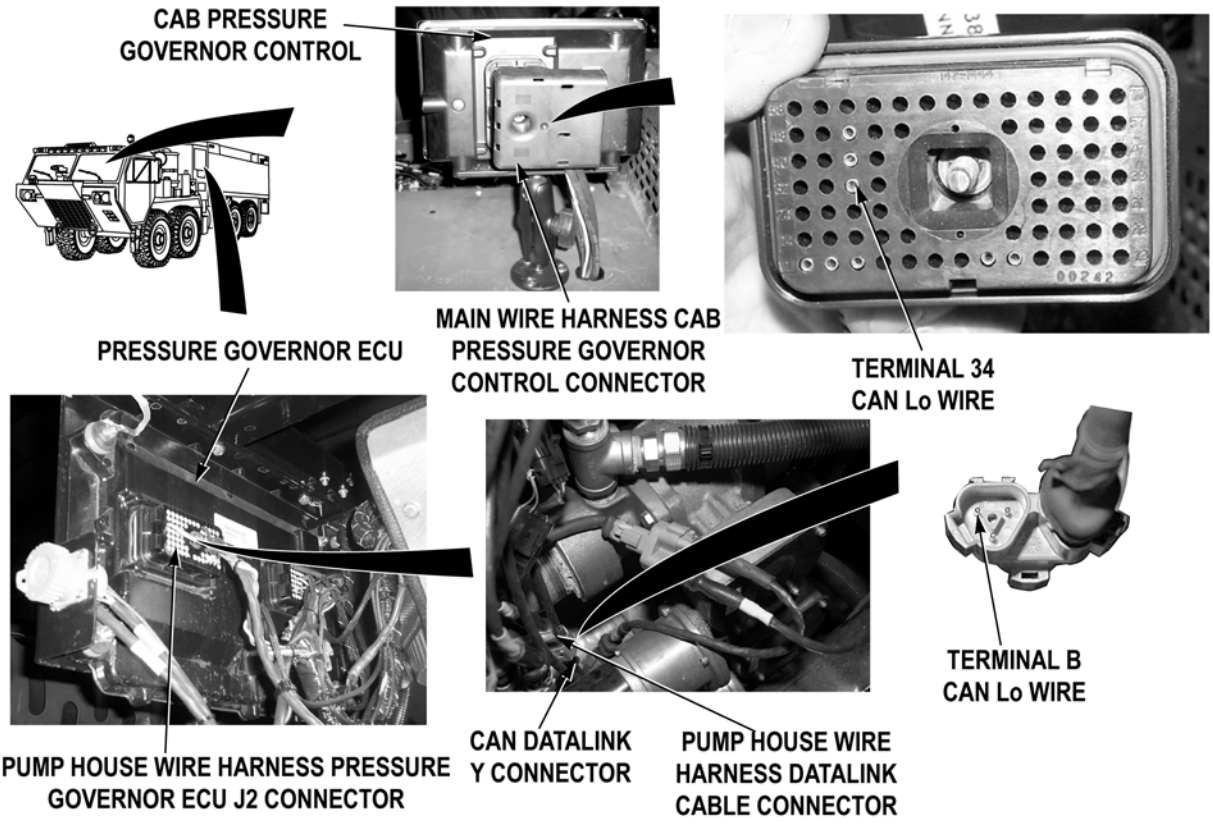
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 47. With a test lead set, check for continuity across CAN Lo wire (green) from main wire harness cab pressure governor control connector, terminal 34 to pump house wire harness pressure governor ECU J2 connector, terminal 68.

If there is continuity, go to Step 49.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

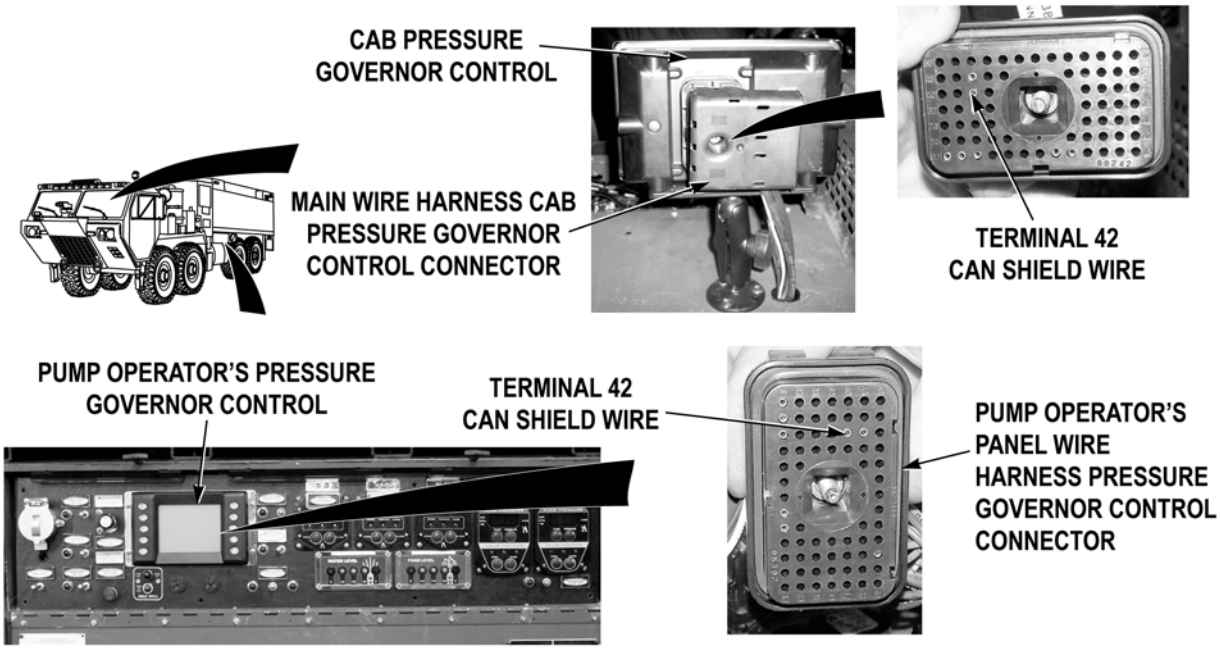
To locate correct datalink cable connector in pump house, follow green banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 48. Disconnect pump house wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Lo wire (green) from CAN datalink cable Y connector (that was disconnected from pump house wire harness), terminal B to main wire harness cab pressure governor control connector, terminal 34.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

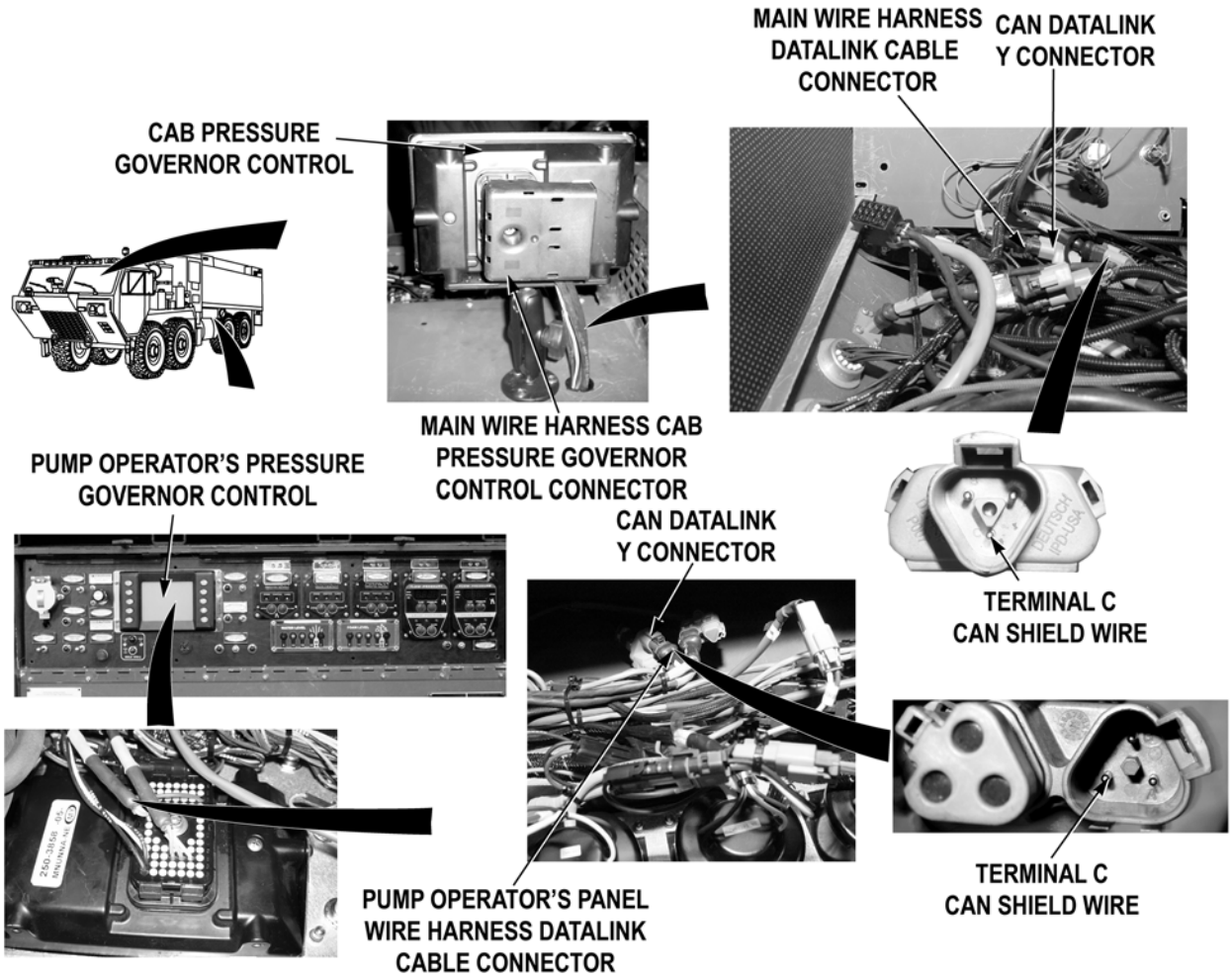
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 49. With a test lead set, check for continuity across CAN Shield (bare) from main wire harness cab pressure governor control connector, terminal 42 to pump operator's panel pressure governor control connector, terminal 42.

If there is continuity, go to Step 54.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



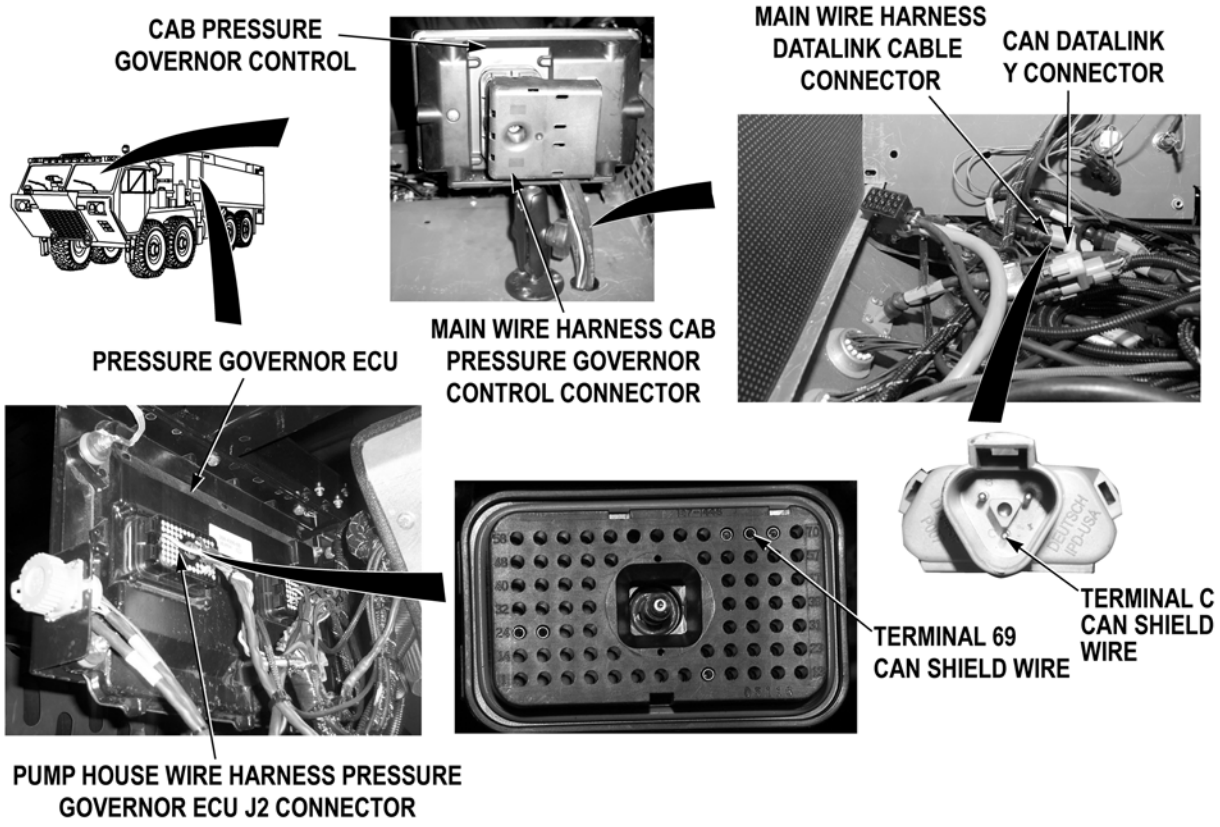
NOTE

- To locate correct datalink cable connector in cab, follow green banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.
- To locate correct datalink cable connector in pump operator's panel, follow green banded datalink cable from pump operator's panel pressure governor control connector to first Y connector in series.

Step 50. Remove cab instrument panel E (WP 0341). Disconnect main wire harness datalink cable connector from CAN datalink Y connector. Disconnect pump operator's panel wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Shield wire (bare) from CAN datalink cable Y connector (that was disconnected from main wire harness), terminal C to CAN datalink cable Y connector (that was disconnected from pump operator's panel wire harness), terminal C.

If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

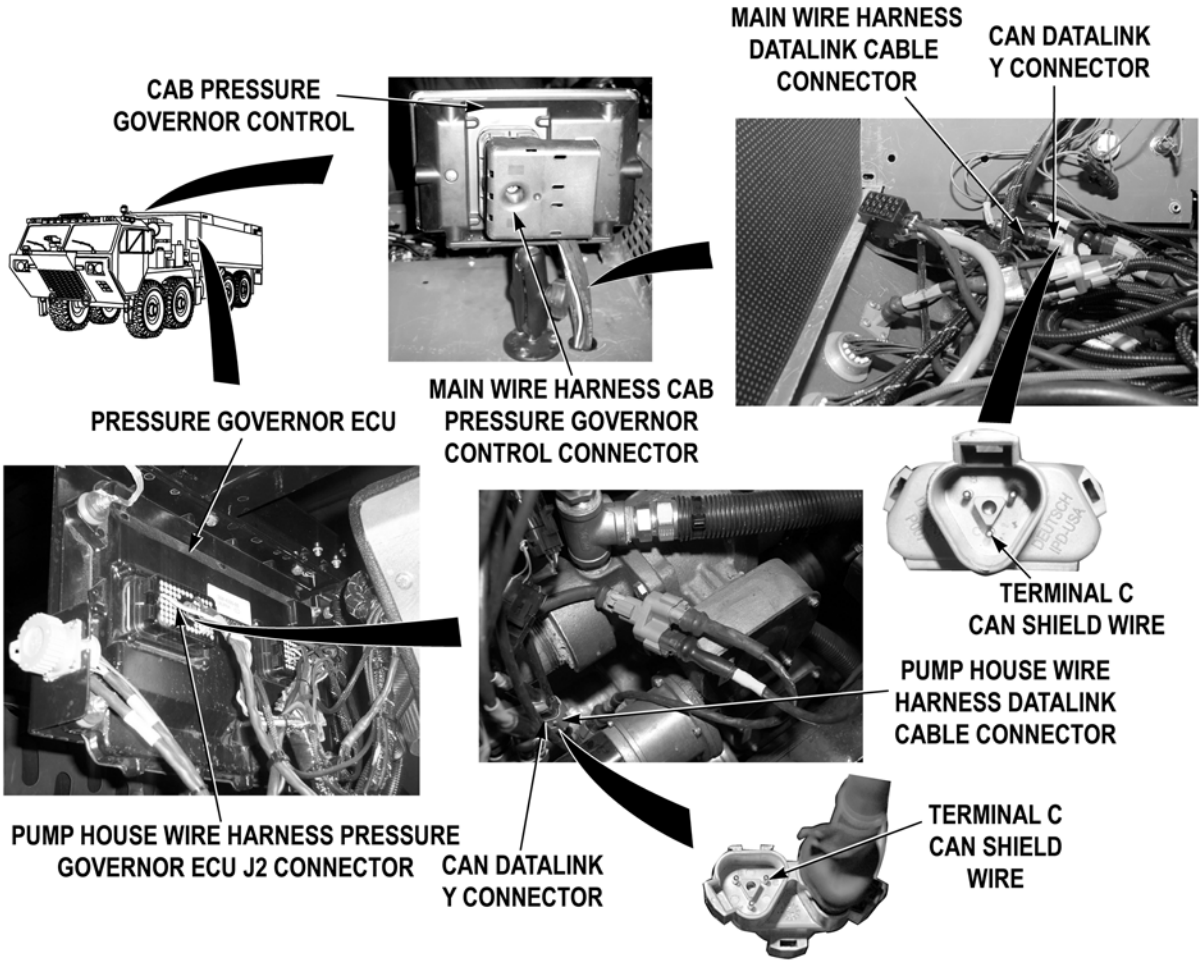
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 51. With a test lead set, check for continuity across CAN Shield wire (bare) from CAN datalink cable Y connector (that was disconnected from main wire harness), terminal C to pump house wire harness pressure governor ECU J2 connector, terminal 69.

If there is continuity, go to Step 53.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

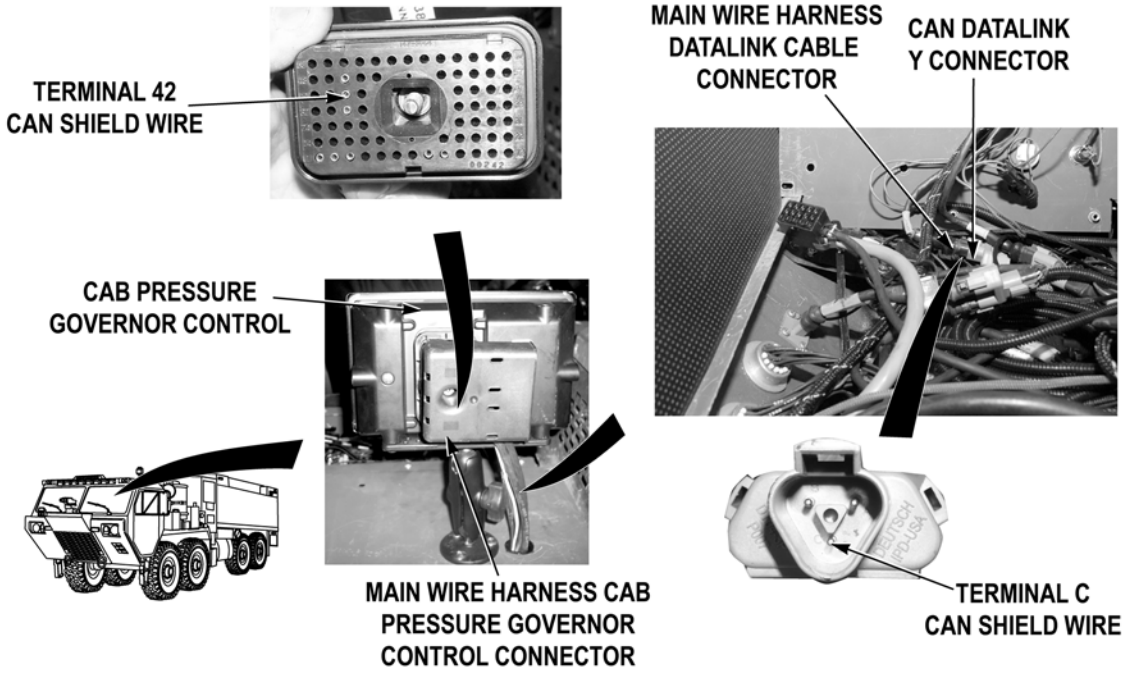
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 52. Disconnect pump house wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Shield wire (bare) from CAN datalink cable Y connector (that was disconnected from pump house wire harness), terminal C to CAN datalink cable Y connector (that was disconnected from main wire harness), terminal C.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

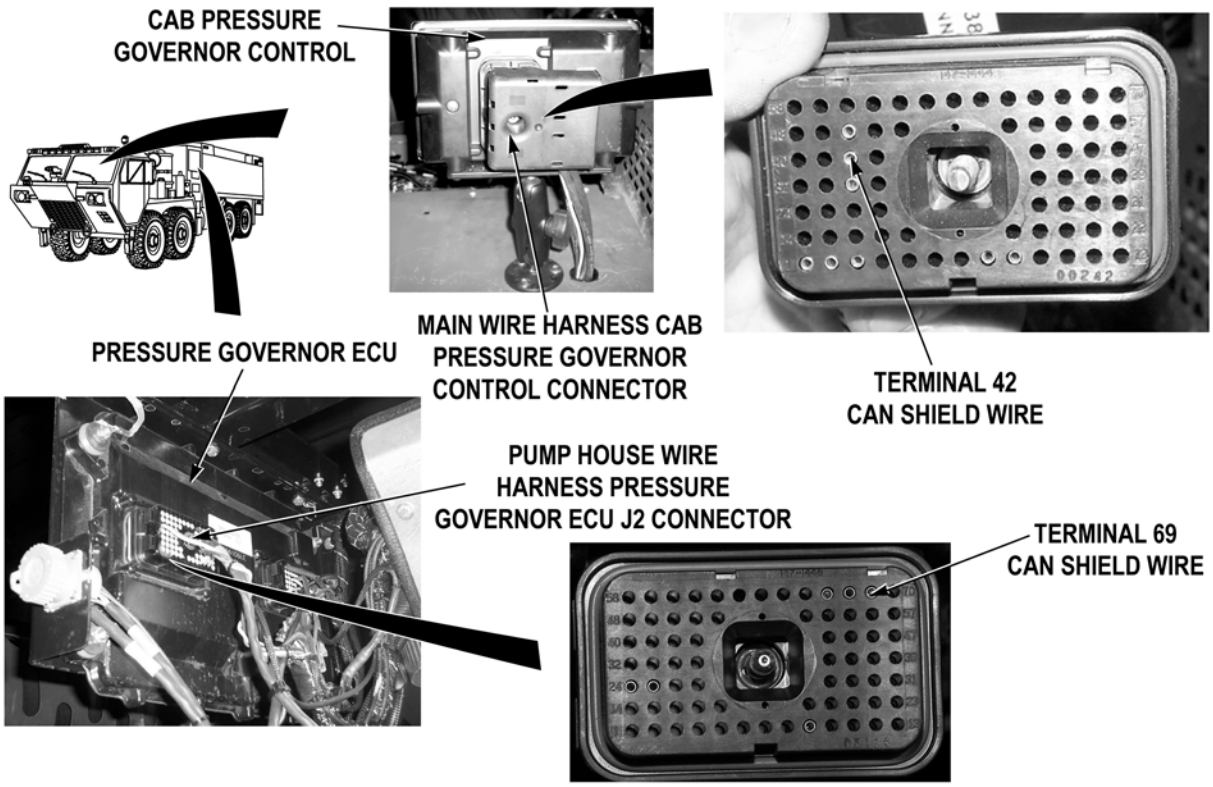


Step 53. With a test lead set, check for continuity across main wire harness CAN Shield wire (bare) from cab pressure governor control connector, terminal 42 to main wire harness datalink cable connector, terminal C.

a. If there is continuity, repair pump operator's panel datalink cable if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair main wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



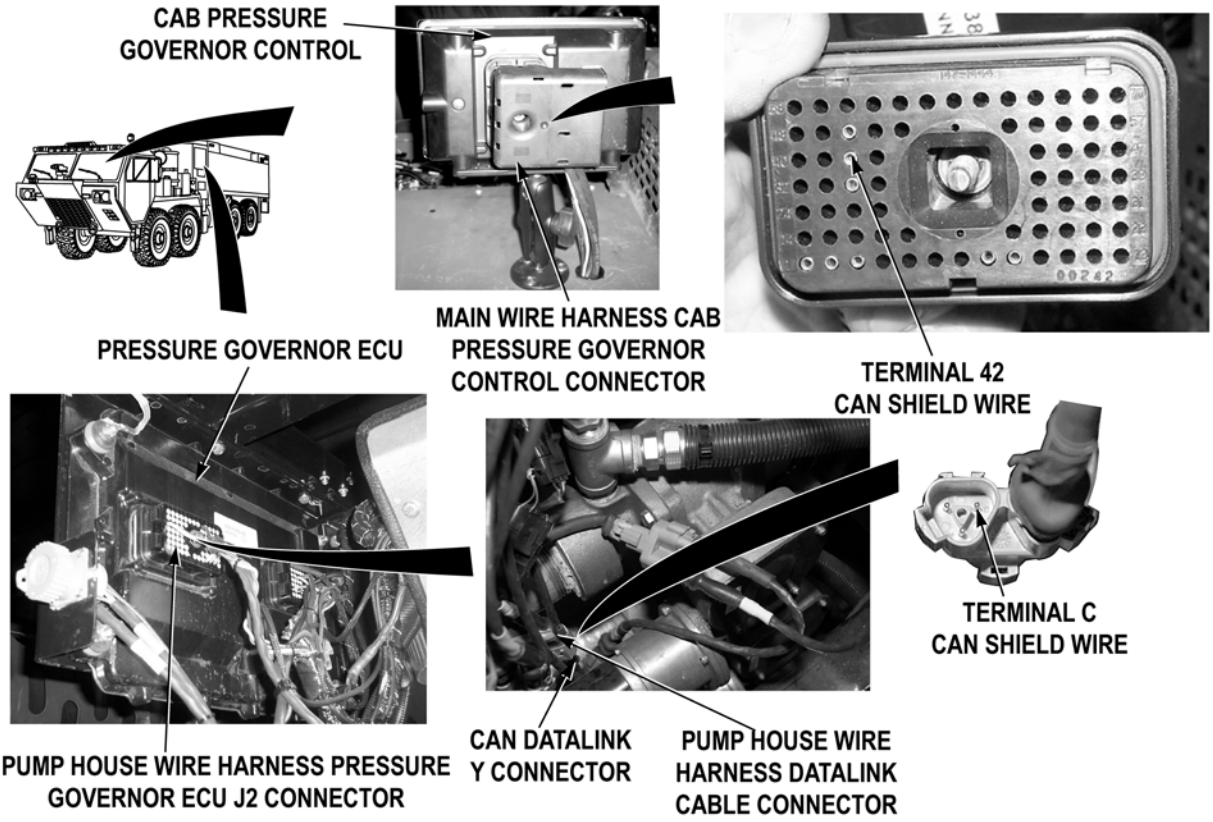
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 54. With a test lead set, check for continuity across CAN Shield wire (bare) from main wire harness cab pressure governor control connector, terminal 42 to pump house wire harness pressure governor ECU J2 connector, terminal 69.

If there is continuity, replace pressure governor ECU (WP 0289).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

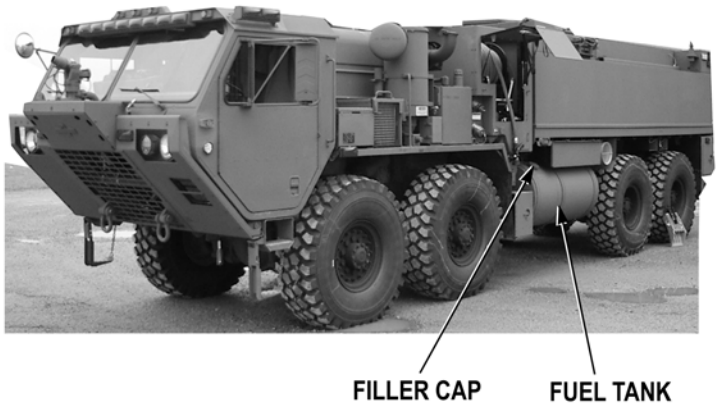
To locate correct datalink cable connector in pump house, follow green banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 55. Disconnect pump house wire harness datalink cable connector from CAN datalink Y connector. With a test lead set, check for continuity across CAN datalink cable CAN Shield wire (bare) from CAN datalink cable Y connector (that was disconnected from pump house wire harness), terminal C to main wire harness cab pressure governor control connector, terminal 42.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAN datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



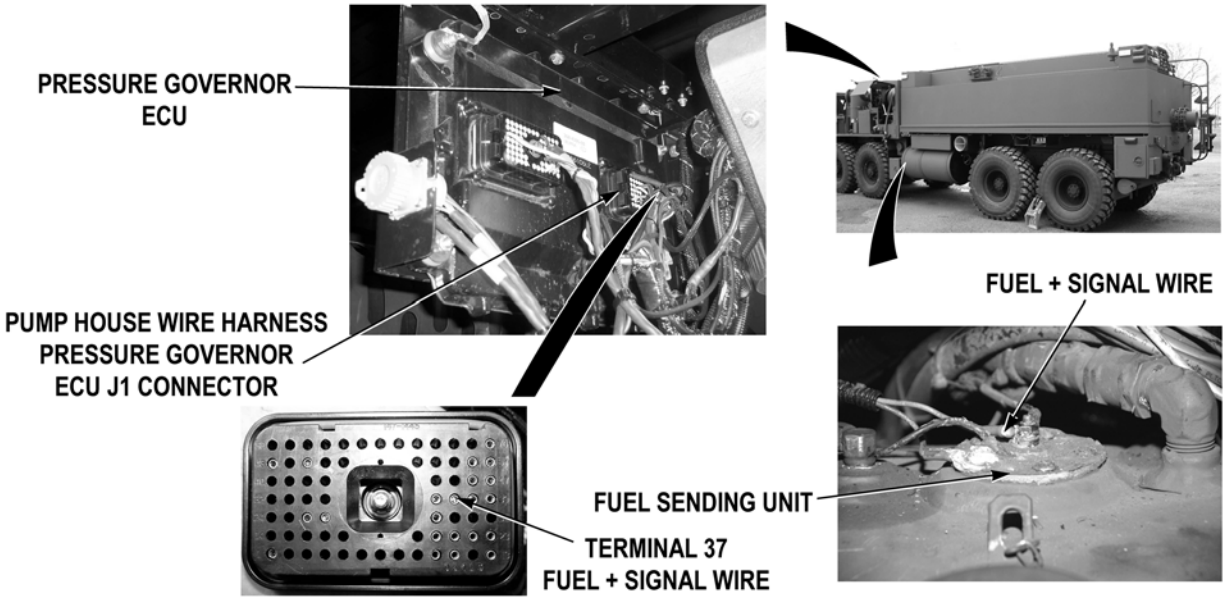
Step 56. Remove fuel tank filler cap and strainer from fuel tank (TM 9-2320-315-14&P). Inspect fuel tank to determine how much fuel is in fuel tank. Check if there is less than 1/8 a tank of fuel in fuel tank.

If there is less than 1/8 a tank of fuel, fill fuel tank (TM 9-2320-315-14&P) and then go to Step 57.

Step 57. Check if cab fuel level gauge is accurate to level of fuel in fuel tank (TM 9-2320-315-14&P).

If cab fuel level gauge is not accurate, troubleshoot Fuel Level Gage Does Not Register Or Registers Inaccurately (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

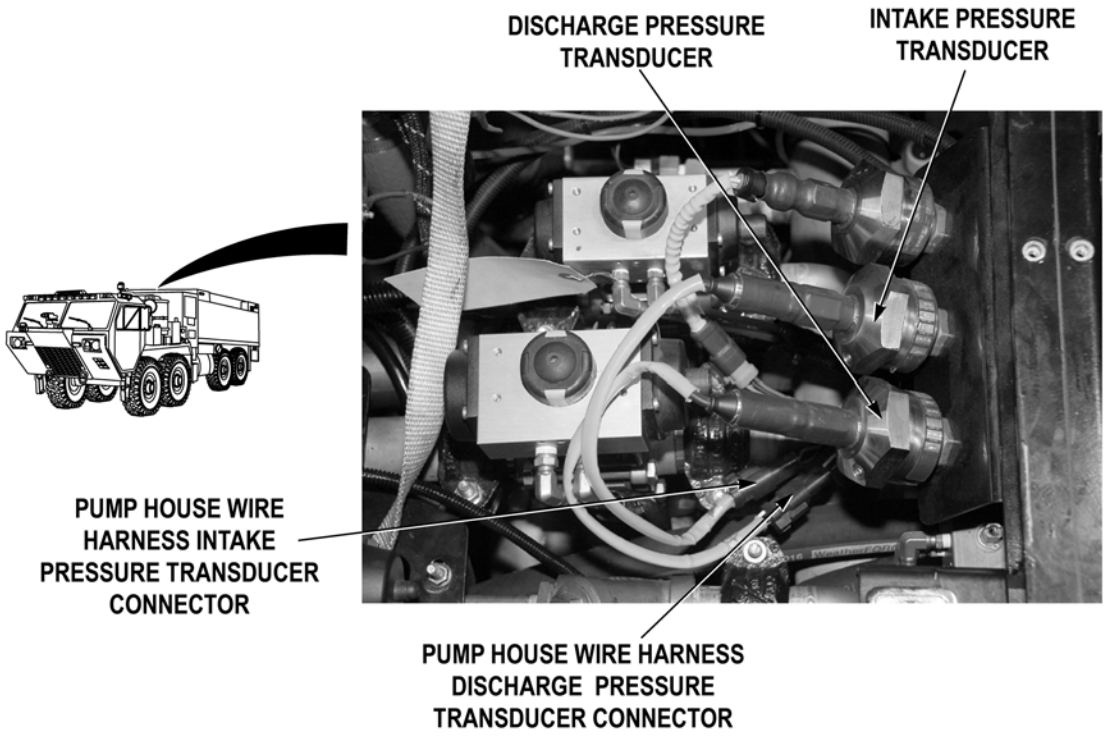
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 58. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness pressure governor ECU J1 connector. Follow wire from center connector of fuel tank sending unit to heat shrink covered connectors. Remove heat shrink and check for continuity across fuel + signal wire (green) from pump house wire harness pressure governor ECU J1 connector, terminal 37 to fuel + signal wire, terminal.

a. If there is continuity, replace diode pack.

b. If there is no continuity, repair fuel + signal wire if repairable (TM 9-2320-315-14&P), or replace fuel + signal wire.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



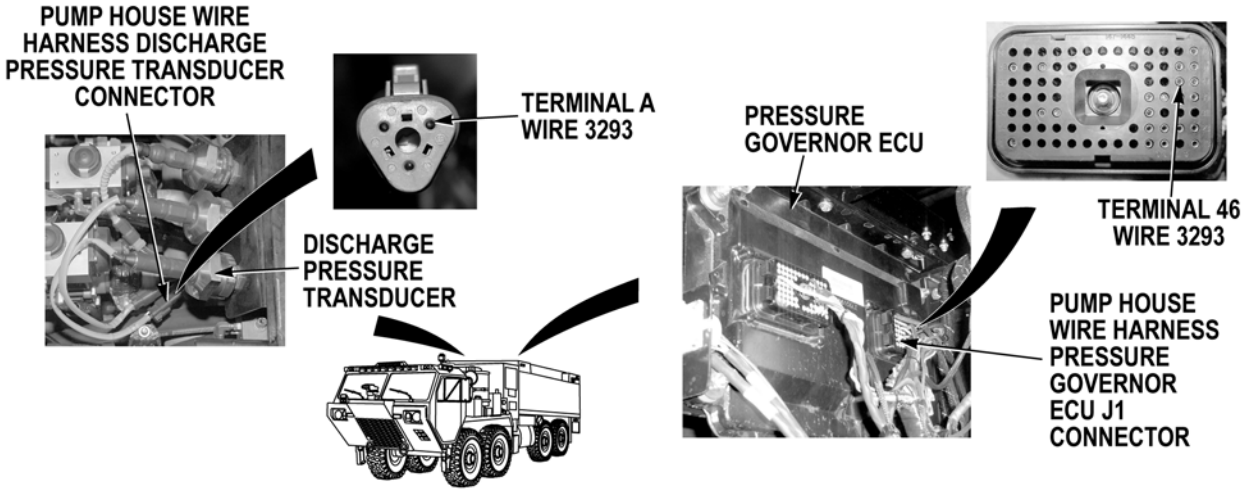
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 59. Turn engine off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness discharge pressure transducer connector. Disconnect pump house wire harness intake pressure transducer connector. Swap pressure transducer connectors on pressure transducers. Push battery disconnect switch to on position (WP 0007). Scroll pressure governor through diagnostic screen and caution faults (WP 0016). Check if caution fault has changed to Intake Pressure Transducer Failure with an Open Circuit (WP 0016).

If caution fault has changed to Intake Pressure Transducer Failure with an Open Circuit, replace discharge pressure transducer (WP 0264).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



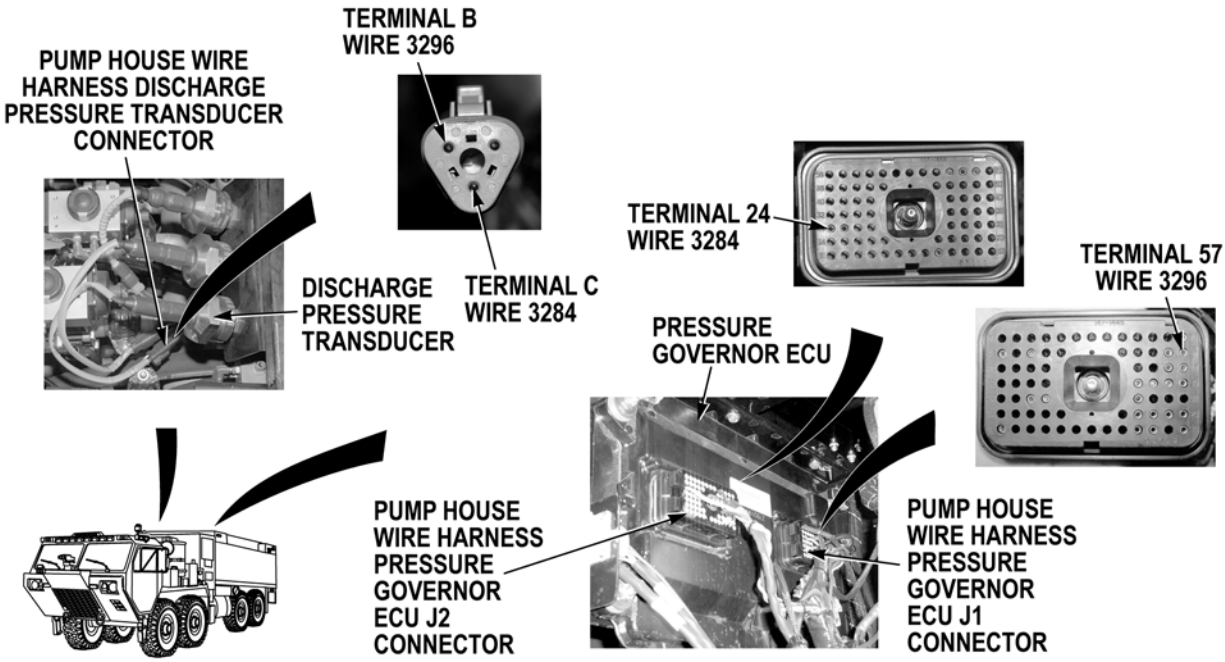
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 60. Pull battery disconnect switch to off position (WP 0007). Put pump house wire harness connector back to original position on intake pressure transducer. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3293 (blue) from pump house wire harness discharge pressure transducer connector, terminal A to pump house wire harness pressure governor ECU J1 connector, terminal 46.

If there is no continuity, repair wire 3293 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 61. With a test lead set, check for continuity across pump house wire harness wire 3296 (black) from pump house wire harness discharge pressure transducer connector, terminal B to pump house wire harness pressure governor ECU J1 connector, terminal 57.

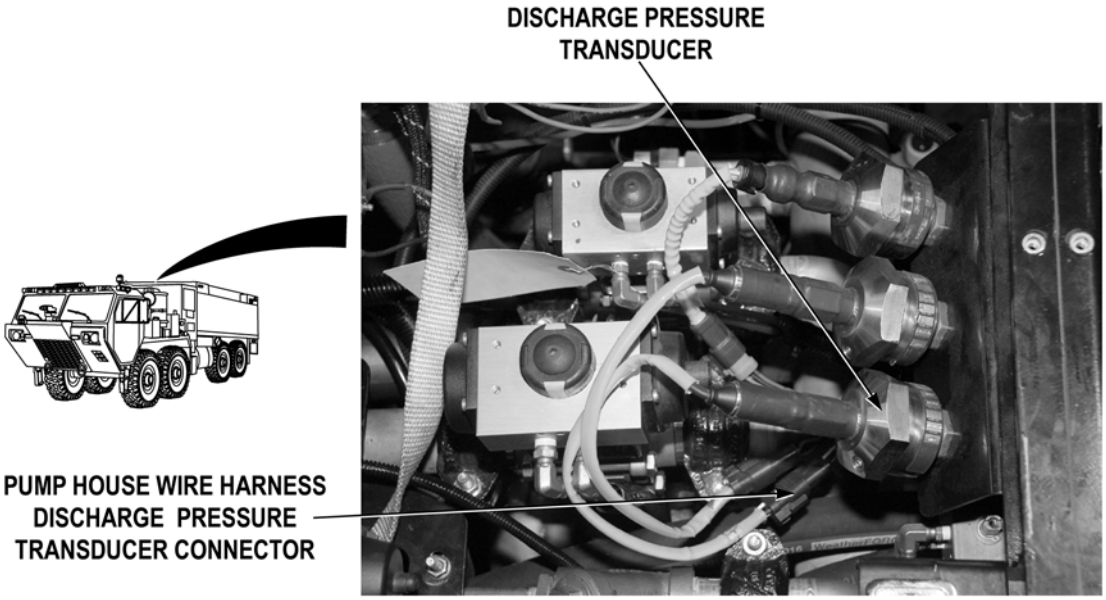
If there is no continuity, repair wire 3296 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 62. Disconnect pump house wire harness pressure governor ECU J2 connector. With a test lead set, check for continuity across pump house wire harness wire 3284 (white) from pump house wire harness discharge pressure transducer connector, terminal C to pump house wire harness pressure governor ECU J2 connector, terminal 24.

a. If there is continuity, replace pressure governor ECU (WP 0121).

b. If there is no continuity, repair wire 3284 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



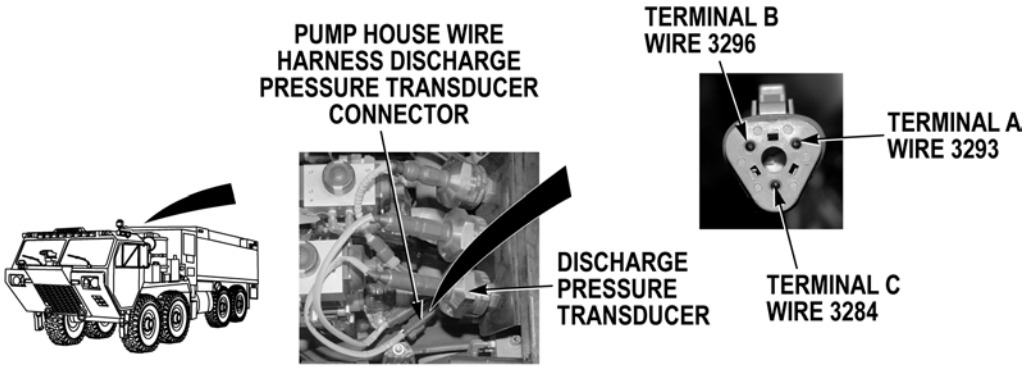
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 63. Turn engine off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness discharge pressure transducer connector. Push battery disconnect switch to on position (WP 0007). Check if pressure governor control displays caution fault, Discharge Pressure Transducer Failure with an Open Circuit (WP 0016).

If pressure governor control displays caution fault, Discharge Pressure Transducer Failure with an Open Circuit, replace discharge pressure transducer (WP 0264).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 64. Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness discharge pressure transducer connector. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3293 (blue) from pump house wire harness discharge pressure transducer connector, terminal A to a known good ground.

If there is continuity, repair wire 3293 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

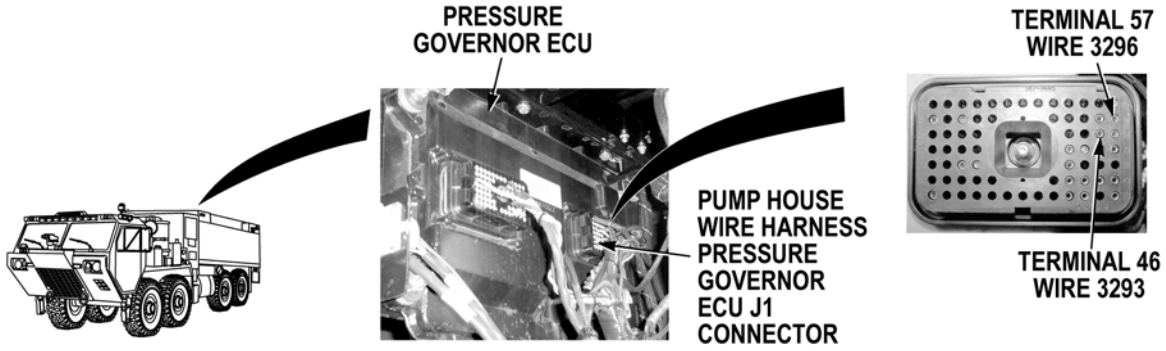
Step 65. With a test lead set, check for continuity across pump house wire harness wire 3296 (black) from pump house wire harness discharge pressure transducer connector, terminal B to a known good ground.

If there is continuity, repair wire 3296 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 66. Disconnect pump house wire harness pressure governor ECU J2 connector. With a test lead set, check for continuity across pump house wire harness wire 3284 (white) from pump house wire harness discharge pressure transducer connector, terminal C to a known good ground.

If there is continuity, repair wire 3284 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

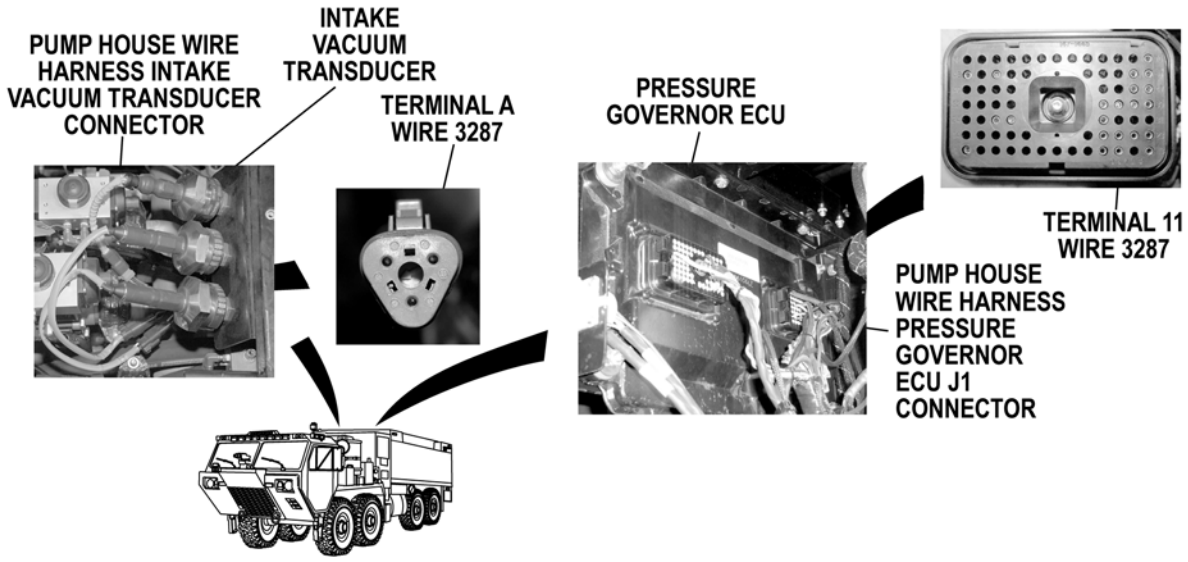


Step 67. With a test lead set, check for continuity between pump house wire harness wire 3293 (blue) and wire 3296 (black) from pump house wire harness pressure governor ECU J1 connector, terminal 46 and terminal 57.

a. If there is continuity, repair wire 3293 and wire 3296 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace pressure governor ECU (WP 0289).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



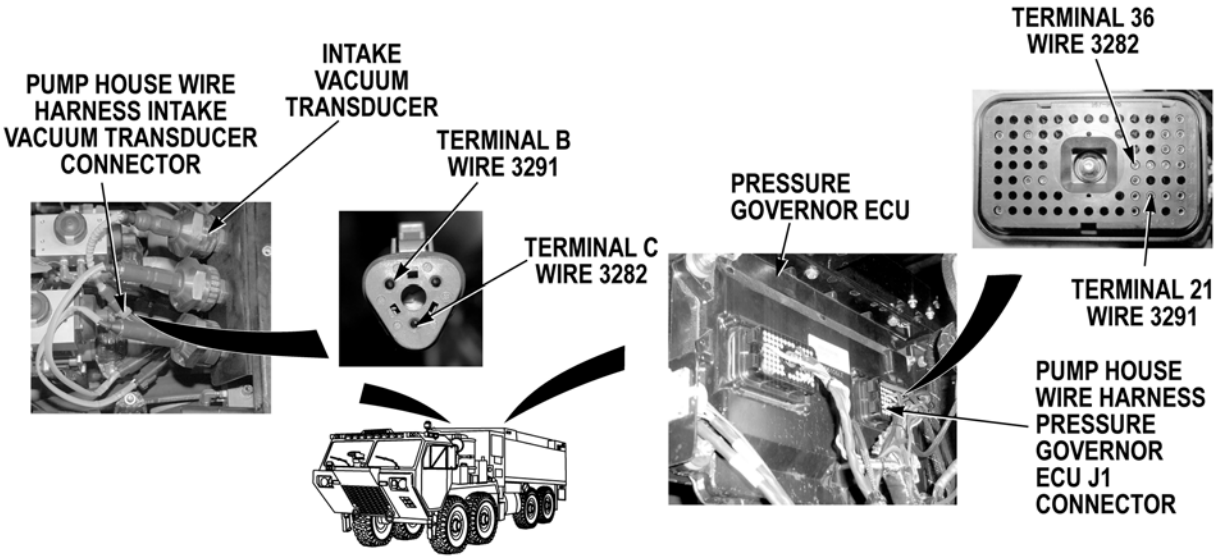
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 68. Turn engine off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness intake vacuum transducer connector. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3287 (orange) from pump house wire harness intake vacuum transducer connector, terminal A to pump house wire harness pressure governor ECU J1 connector, terminal 11.

If there is no continuity, repair wire 3287 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 69. With a test lead set, check for continuity across pump house wire harness wire 3291 (black) from pump house wire harness intake vacuum transducer connector, terminal B to pump house wire harness pressure governor ECU J1 connector, terminal 21.

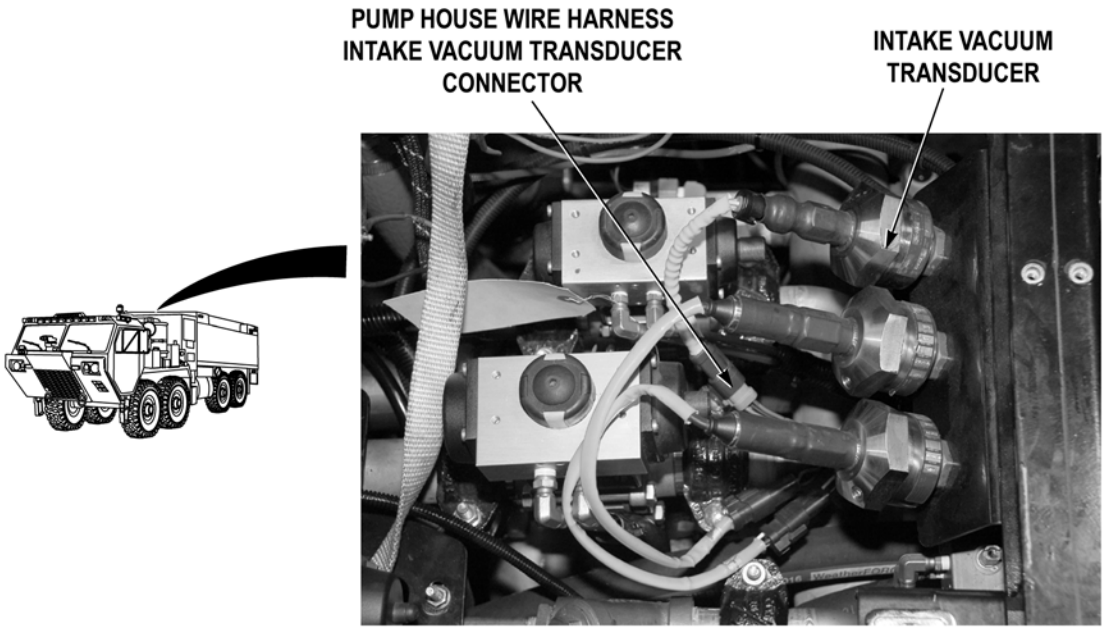
If there is no continuity, repair wire 3297 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 70. With a test lead set, check for continuity across pump house wire harness wire 3282 (orange) from pump house wire harness intake vacuum transducer connector, terminal C to pump house wire harness pressure governor ECU J1 connector, terminal 36.

a. If there is continuity, replace intake vacuum transducer (WP 0264).

b. If there is no continuity, repair wire 3282 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



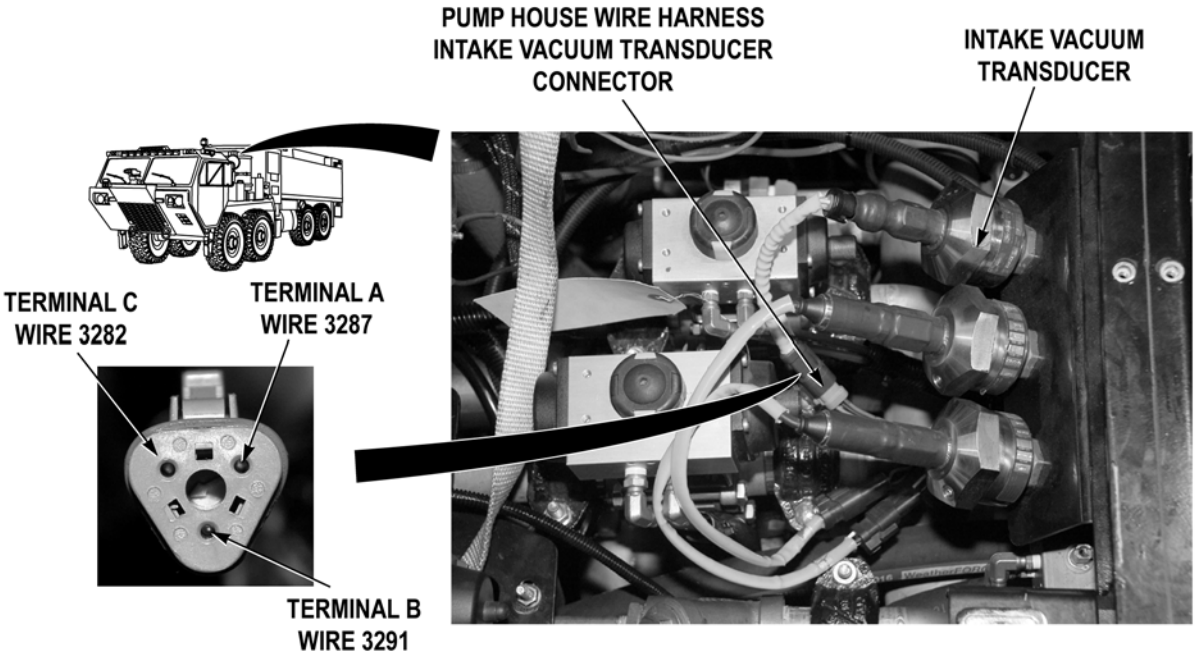
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 71. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness intake vacuum transducer connector. Push battery disconnect switch to on position (WP 0007). Check if pressure governor control displays caution fault, Intake Vacuum Transducer Failure with an Open Circuit.

If pressure governor control displays caution fault, Intake Vacuum Transducer Failure with an Open Circuit, replace intake vacuum transducer (WP 0264).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 72. Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness intake vacuum transducer connector. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3287 (orange) from pump house wire harness intake vacuum transducer connector, terminal A to a known good ground.

If there is continuity, repair wire 3287 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

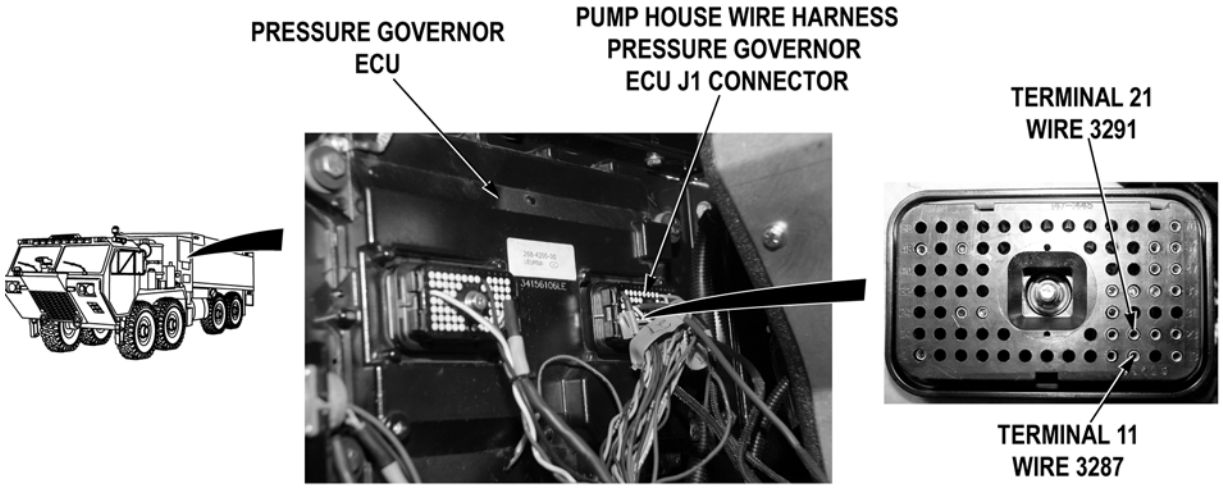
Step 73. With a test lead set, check for continuity across pump house wire harness wire 3291 (black) from pump house wire harness intake vacuum transducer connector, terminal B to a known good ground.

If there is continuity, repair wire 3291 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 74. With a test lead set, check for continuity across pump house wire harness wire 3282 (orange) from pump house wire harness discharge pressure transducer connector, terminal C to a known good ground.

If there is continuity, repair wire 3282 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

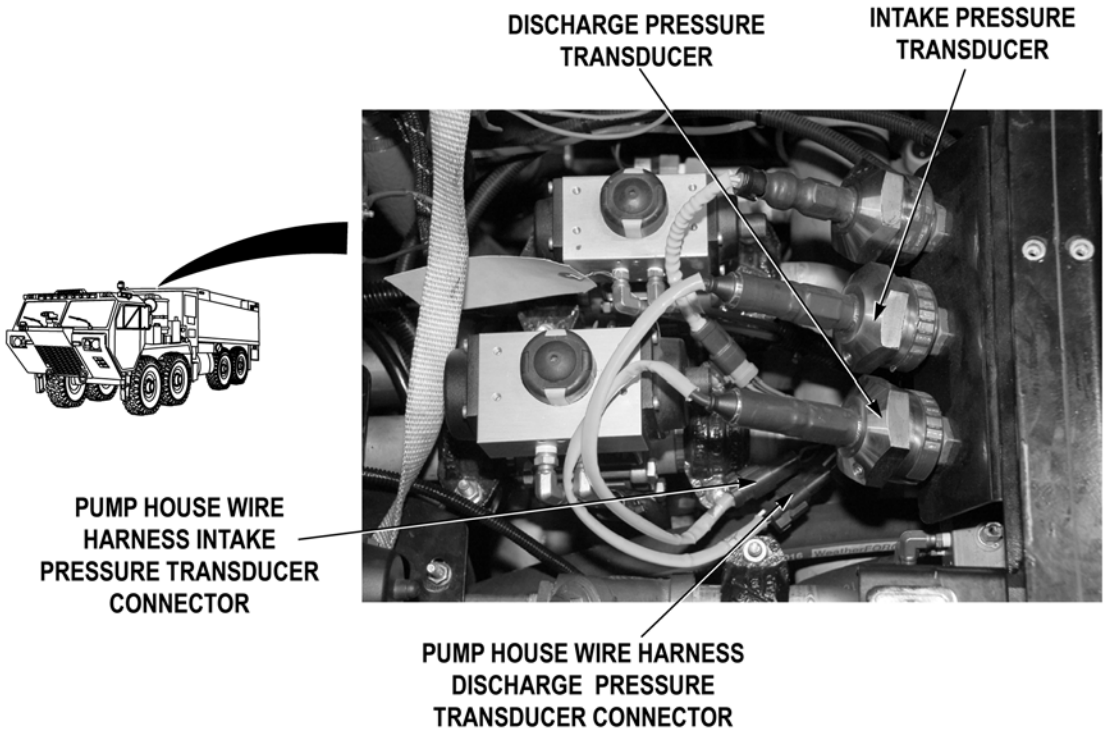


Step 75. With a test lead set, check for continuity between pump house wire harness wire 3287 (orange) and wire 3291 (black) from pump house wire harness pressure governor ECU J1 connector, terminal 11 and terminal 21.

a. If there is continuity, repair wire 3287 and wire 3291 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace pressure governor ECU (WP 0289).

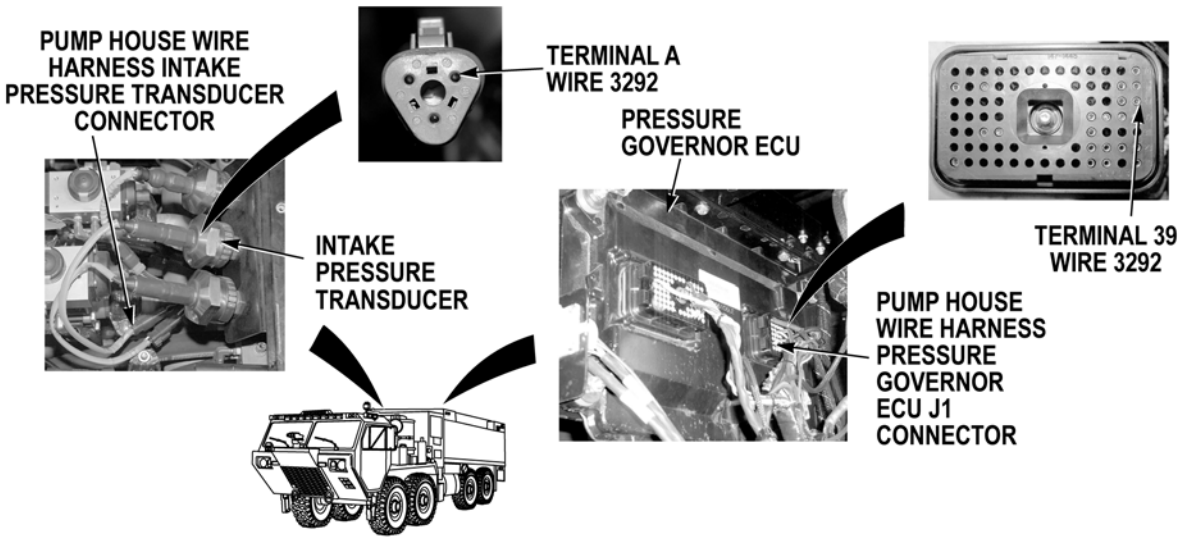
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 76. Turn engine off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness discharge pressure transducer connector. Disconnect pump house wire harness intake pressure transducer connector. Swap pump house wire harness pressure transducer connectors on pressure transducers. Push battery disconnect switch to on position (WP 0007). Scroll pressure governor through diagnostic screen and caution faults (WP 0016). Check if caution fault has changed to Discharge Pressure Transducer Failure with an Open Circuit (WP 0016).

If caution fault has changed to Discharge Pressure Transducer Failure with an Open Circuit, replace Intake pressure transducer (WP 0264).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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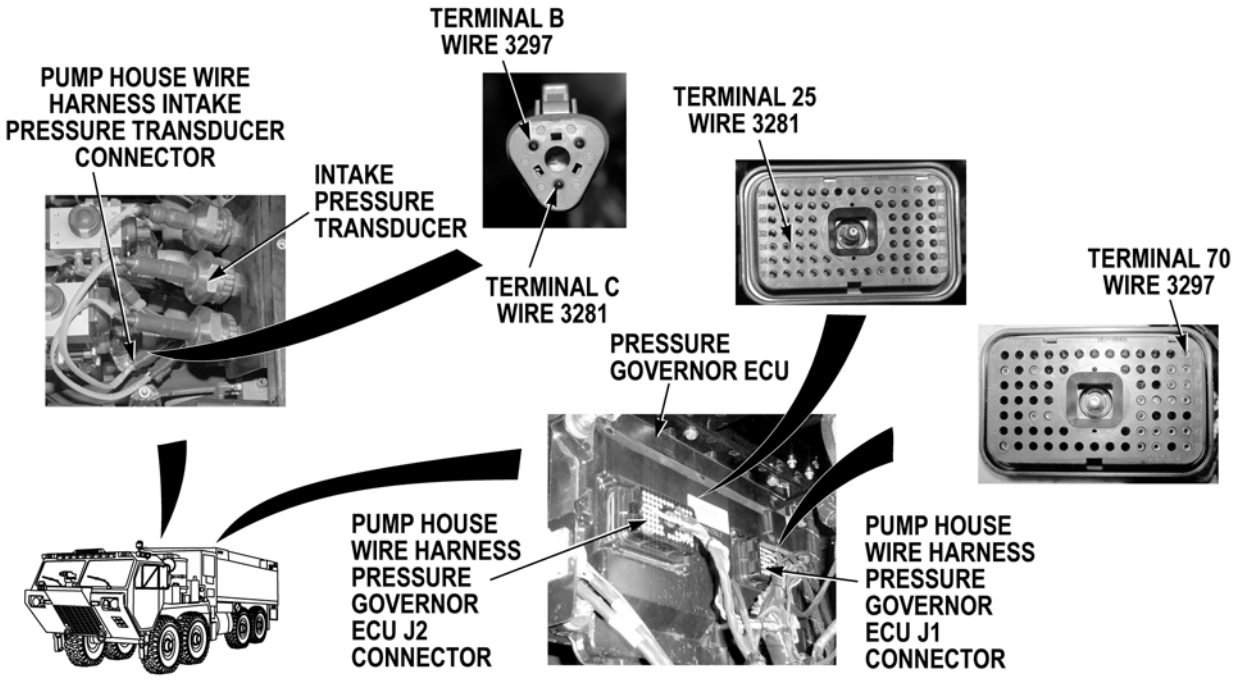
Step 77. Pull battery disconnect switch to off position (WP 0007). Put pump house wire harness connector back to original position on discharge pressure transducer. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3292 (gray) from pump house wire harness intake pressure transducer connector, terminal A to pump house wire harness pressure governor ECU J1 connector, terminal 39.

If there is no continuity, repair wire 3292 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 78. With a test lead set, check for continuity across pump house wire harness wire 3297 (black) from pump house wire harness intake pressure transducer connector, terminal B to pump house wire harness pressure governor ECU J1 connector, terminal 70.

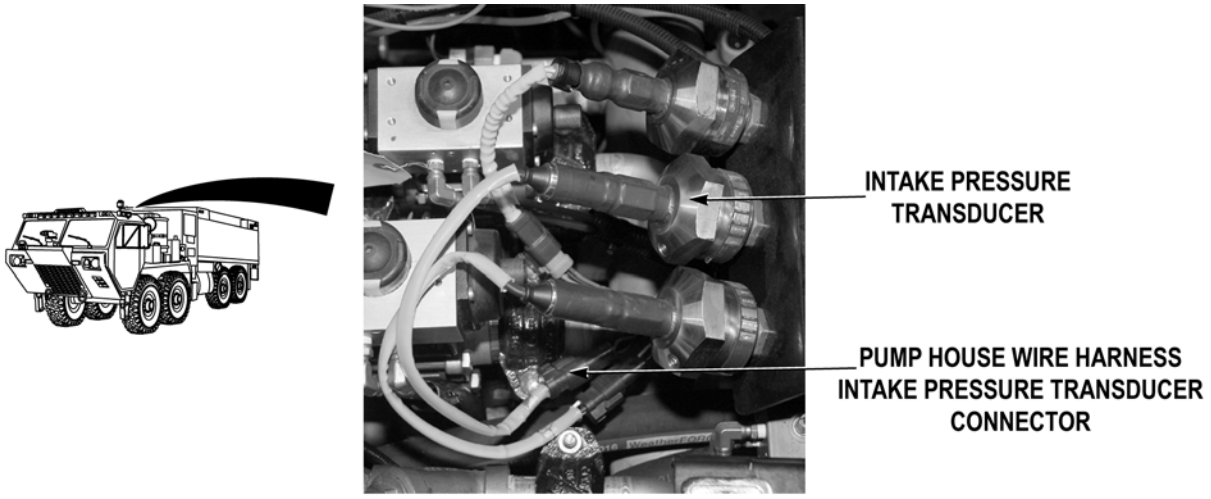
If there is no continuity, repair wire 3297 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 79. Disconnect pump house wire harness pressure governor ECU J2 connector. With a test lead set, check for continuity across pump house wire harness wire 3281 (purple) from pump house wire harness intake pressure transducer connector, terminal C to pump house wire harness pressure governor ECU J2 connector, terminal 25.

a. If there is continuity, replace pressure governor ECU (WP 0121).

b. If there is no continuity, repair wire 3281 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

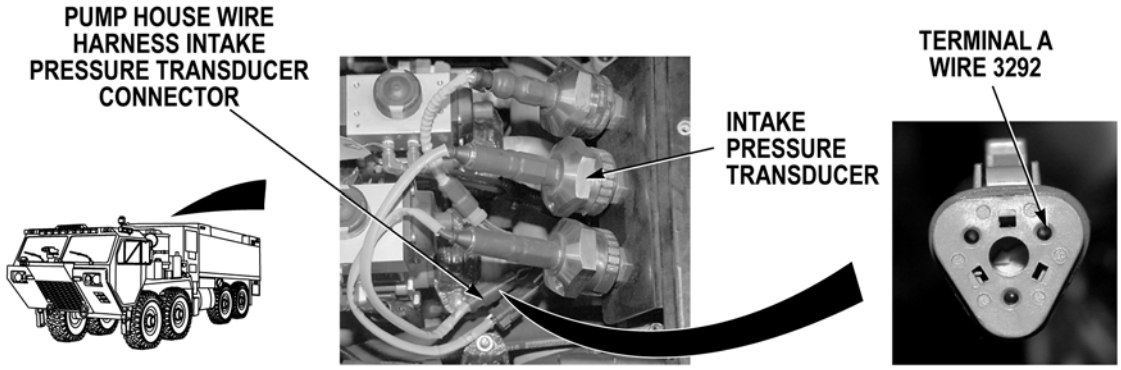
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 80. Turn engine off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness intake pressure transducer connector. Push battery disconnect switch to on position (WP 0007). Check if pressure governor control displays caution fault, Intake Pressure Transducer Failure with an Open Circuit (WP 0016).

If pressure governor control displays caution fault, Intake Pressure Transducer Failure with an Open Circuit, replace intake pressure transducer (WP 0264).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



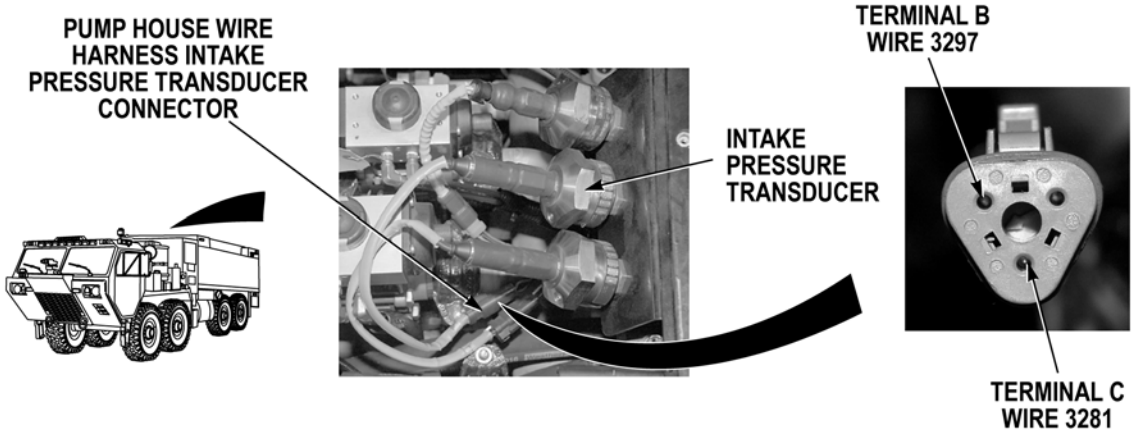
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 81. Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness intake pressure transducer connector. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3292 (gray) from pump house wire harness intake pressure transducer connector, terminal A to a known good ground.

If there is continuity, repair wire 3292 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



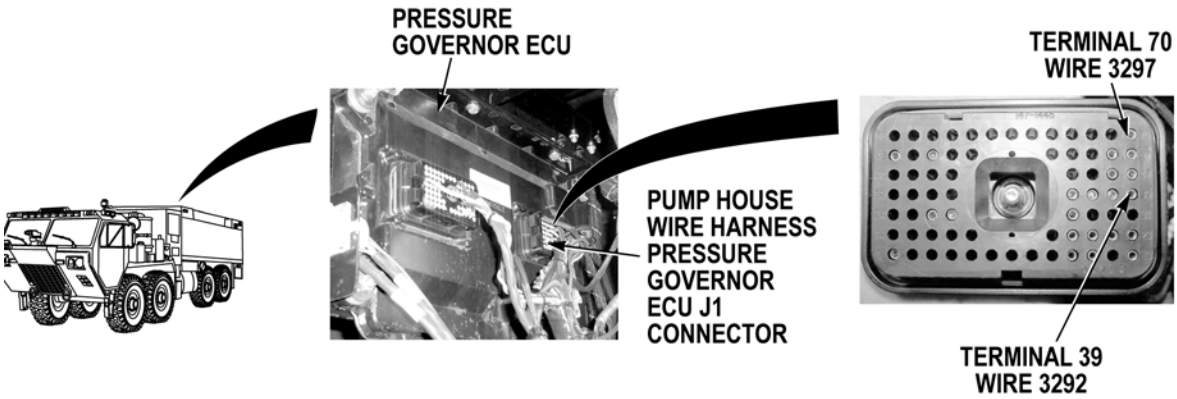
Step 82. With a test lead set, check for continuity across pump house wire harness wire 3297 (black) from pump house wire harness intake pressure transducer connector, terminal B to a known good ground.

If there is continuity, repair wire 3297 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 83. Disconnect pump house wire harness pressure governor ECU J2 connector. With a test lead set, check for continuity across pump house wire harness wire 3281 (purple) from pump house wire harness discharge pressure transducer connector, terminal C to a known good ground.

If there is continuity, repair wire 3281 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

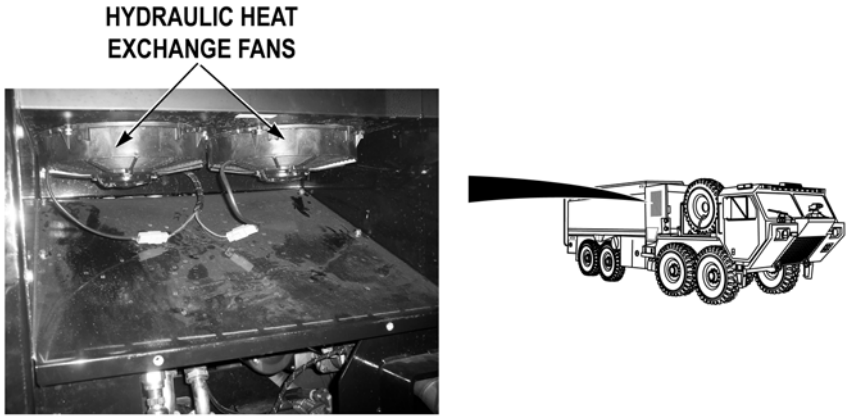


Step 84. With a test lead set, check for continuity between pump house wire harness wire 3292 (blue) and wire 3297 (black) from pump house wire harness pressure governor ECU J1 connector, terminal 39 and terminal 70.

a. If there is continuity, repair wire 3292 and wire 3297 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace pressure governor ECU (WP 0289).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Stay clear of rotating PUMP PTO drive shaft. Clothing or other material may catch on rotating PUMP PTO drive shaft, causing damage to equipment or serious injury or death to personnel.

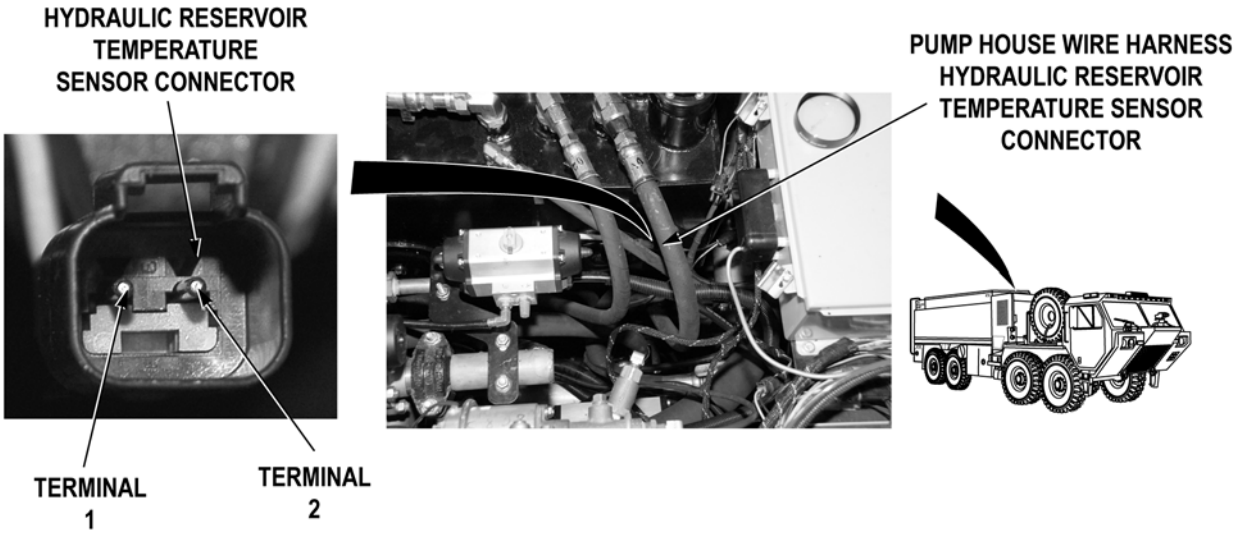
NOTE

Hydraulic oil must be over 125° F (52°C) before performing Step 85. Hydraulic oil temperature may be observed at either cab pressure governor control or pump operator's panel pressure governor control (WP 0016).

Step 85. Turn Engine Off (TM 9-2320-279-10). Remove pump house panel H (WP 0341). Start Engine (TM 9-2320-279-10). Put PUMP PTO switch to on position (WP 0004). Put cab TANK TO PUMP switch to on position (WP 0004). Enable pressure governor control at either cab or pump operator's panel (WP 0016). Allow hydraulic system to warm to 125º F (52º C) or greater. Check if fan 1 and fan 2 operates when hydraulic oil heats to 125º F (52º C) or greater.

If fan 1 and fan 2 do not operate, troubleshoot Hydraulic Heat Exchanger Fan(s) Do Not Operate (WP 0055).

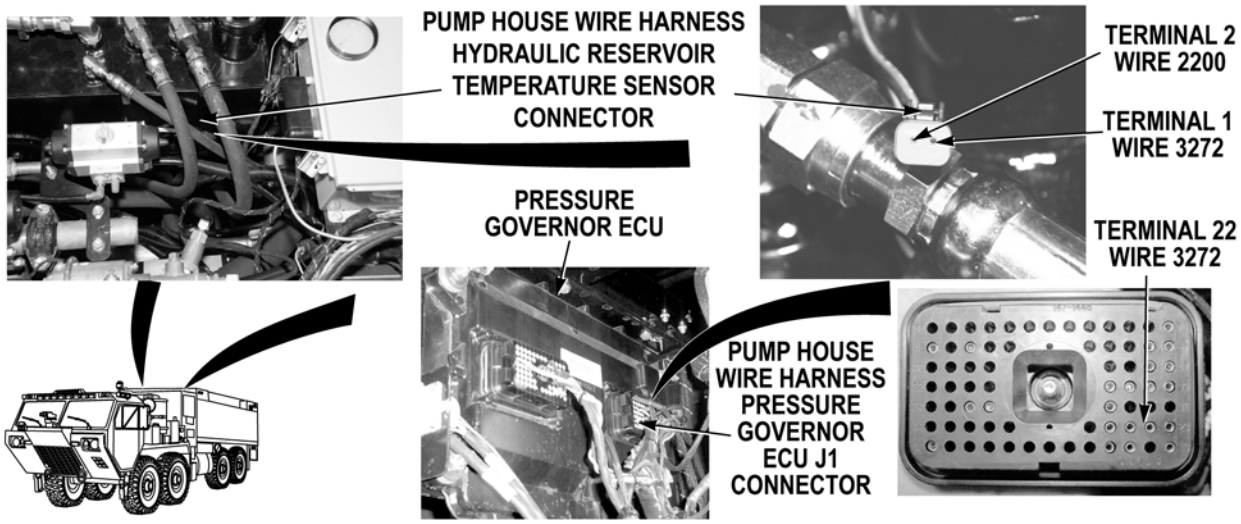
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 86. Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness hydraulic reservoir temperature sensor connector. Check for 28 to 29K ohms resistance across hydraulic reservoir temperature sensor from hydraulic reservoir temperature sensor connector, terminal 1 to terminal 2.

If there is less than 28 ohms or greater than 29K ohms, replace hydraulic reservoir temperature sensor (WP 0148).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 87. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across pump house wire harness wire 3272 (blue) from pump house wire harness hydraulic reservoir temperature sensor connector, terminal 1 to pump house wire harness pressure governor ECU J1 connector, terminal 22.

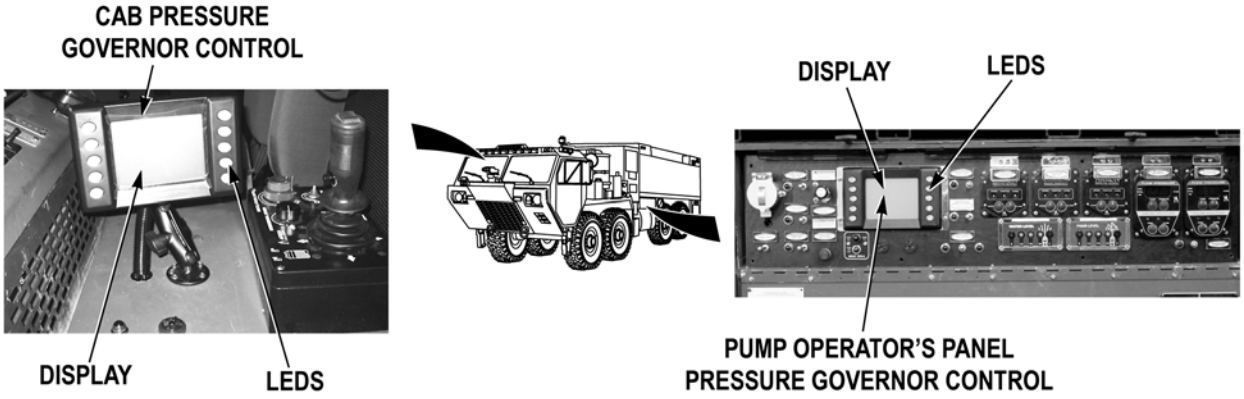
If there is no continuity, repair wire 3272 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 88. With a test lead set, check for continuity across pump house wire harness wire 2200 (black) from pump house wire harness hydraulic reservoir temperature sensor connector, terminal 2 to a known good ground.

a. If there is continuity, replace pressure governor control ECU (WP 0289).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 89. Check if only one pressure governor control does not operate.

a. If only pump operator's panel pressure governor control does not operate, go to Step 99.

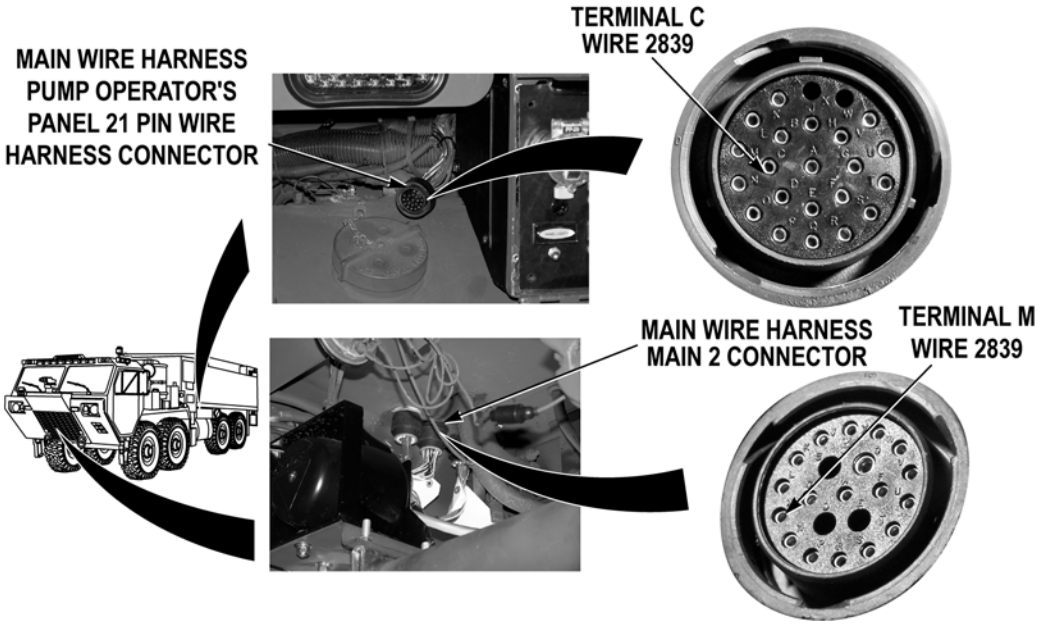
b. If only cab pressure governor control does not operate, go to Step 94.

c. If both pressure governor controls do not operate, go to Step 90.

Step 90. Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if front and rear lower warning light operates.

If front and rear lower warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0100).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

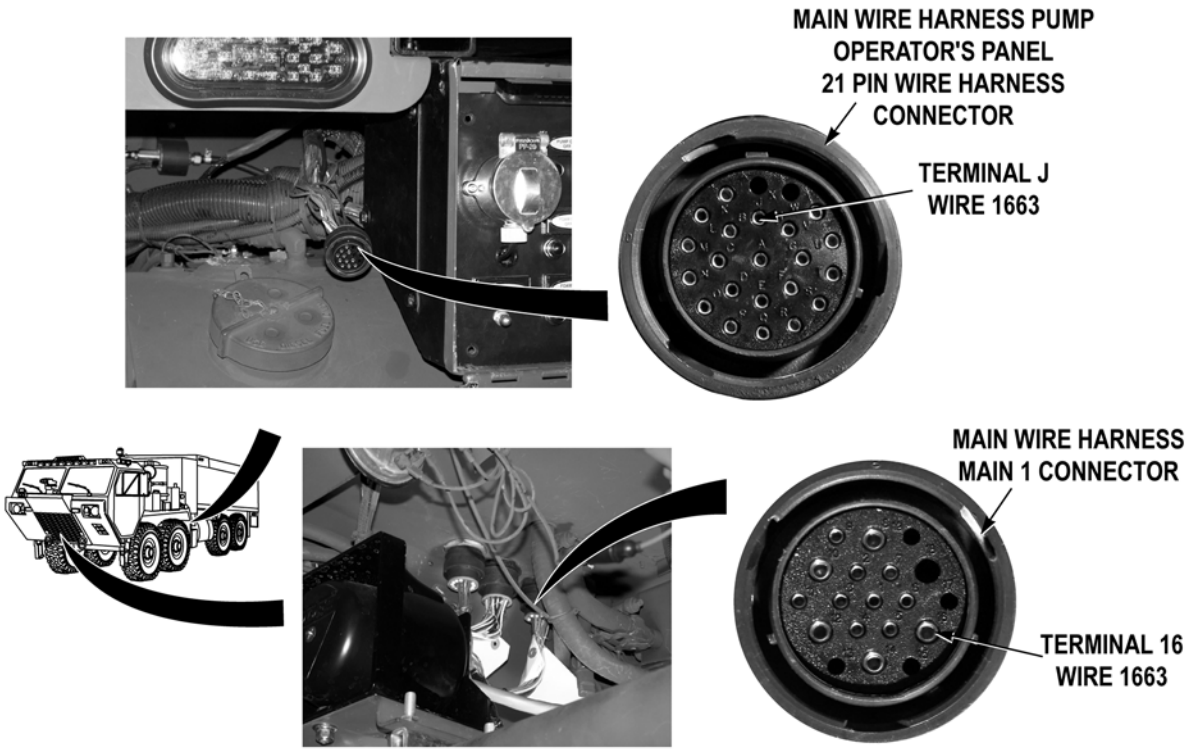
Step 91. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire 2839 (white) at main wire harness main 2 connector, terminal M and a known good ground.

If 22 to 28 VDC are not present, repair wire 2839 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 92. Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump operator’s panel wire harness 21 pin connector. With a test lead set, check for continuity across main wire harness wire 2839 (white) from main wire harness main 2 connector, terminal M to main wire harness pump operator’s panel 21 pin connector, terminal C.

If there is no continuity, repair wire 2839 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 93. With a test lead set, check for continuity across main wire harness wire 1663 (black) from main wire harness main 1 connector, terminal 16 to main wire harness pump operator’s panel 21 pin connector, terminal J.

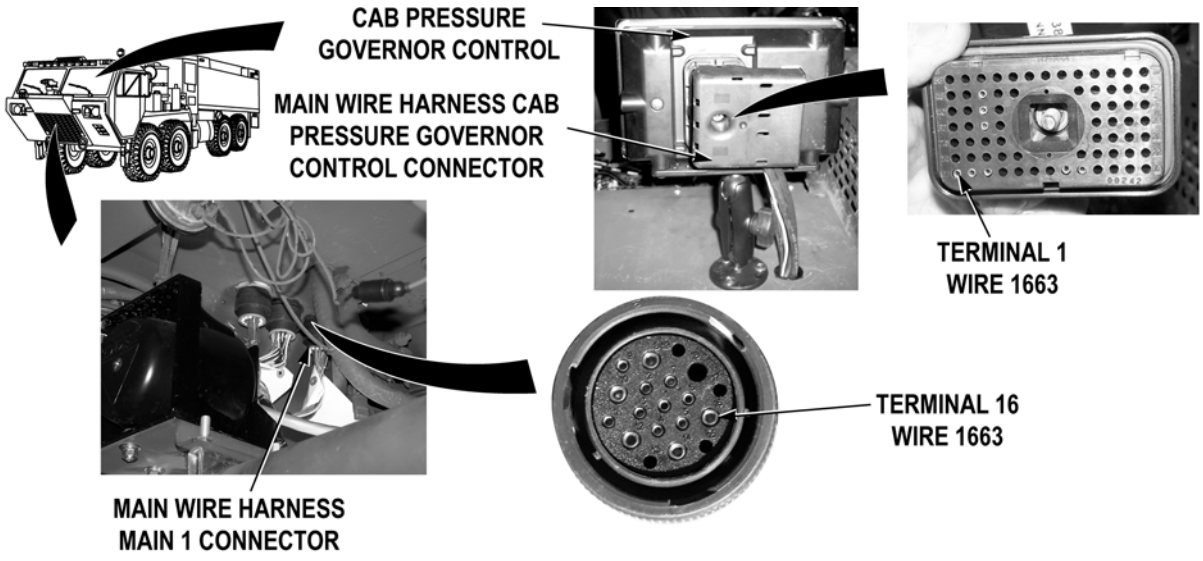
a. If there is continuity, repair wire 1663 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1663 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 94. Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness cab pressure governor control connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between wire 1663 (black) at main wire harness cab pressure governor control connector, terminal 1 and a known good ground.

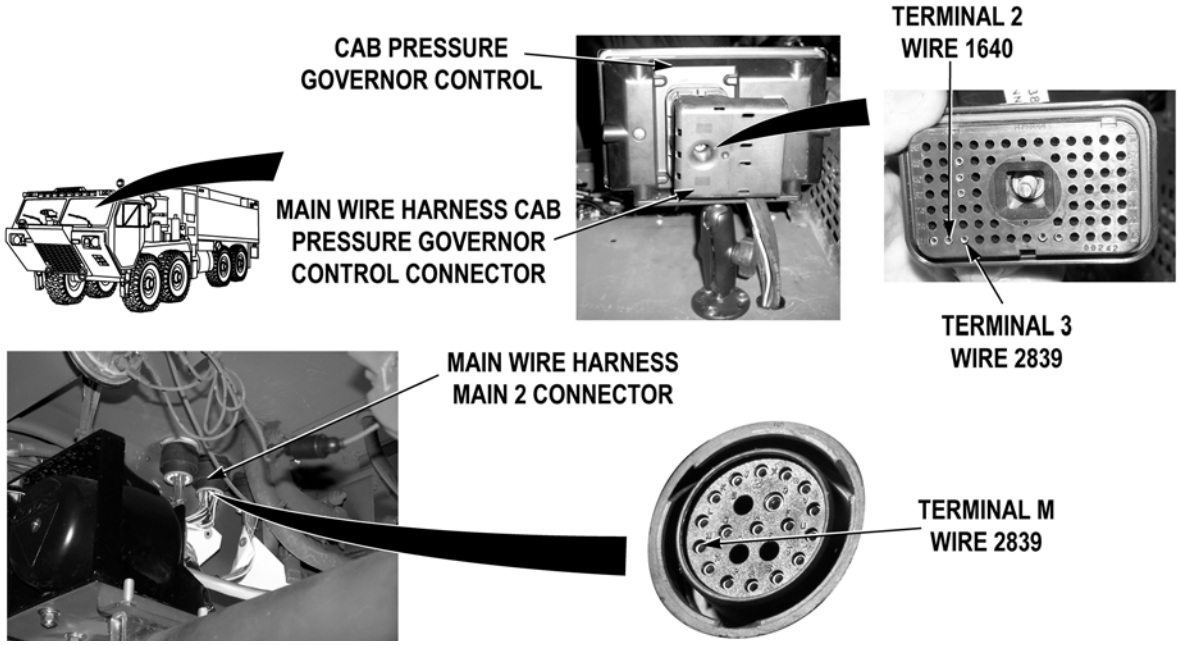
If 22 to 28 VDC are present, go to Step 96.

Step 95. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 1663 (black) from main wire harness main 1 connector, terminal 16 to main wire harness cab pressure governor control connector, terminal 1.

a. If there is continuity, repair wire 1663 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1663 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 96. With a test lead set, check for 22 to 28 VDC between wire 2839 (white) at main wire harness cab pressure governor control connector, terminal 3 and a known good ground.

If 22 to 28 VDC are present, go to Step 98.

Step 97. Pull battery disconnect switch to off position (WP 0004). Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 2839 (white) from main wire harness cab pressure governor control connector, terminal 3 to main wire harness main 2 connector, terminal M.

a. If there is continuity, repair wire 2839 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

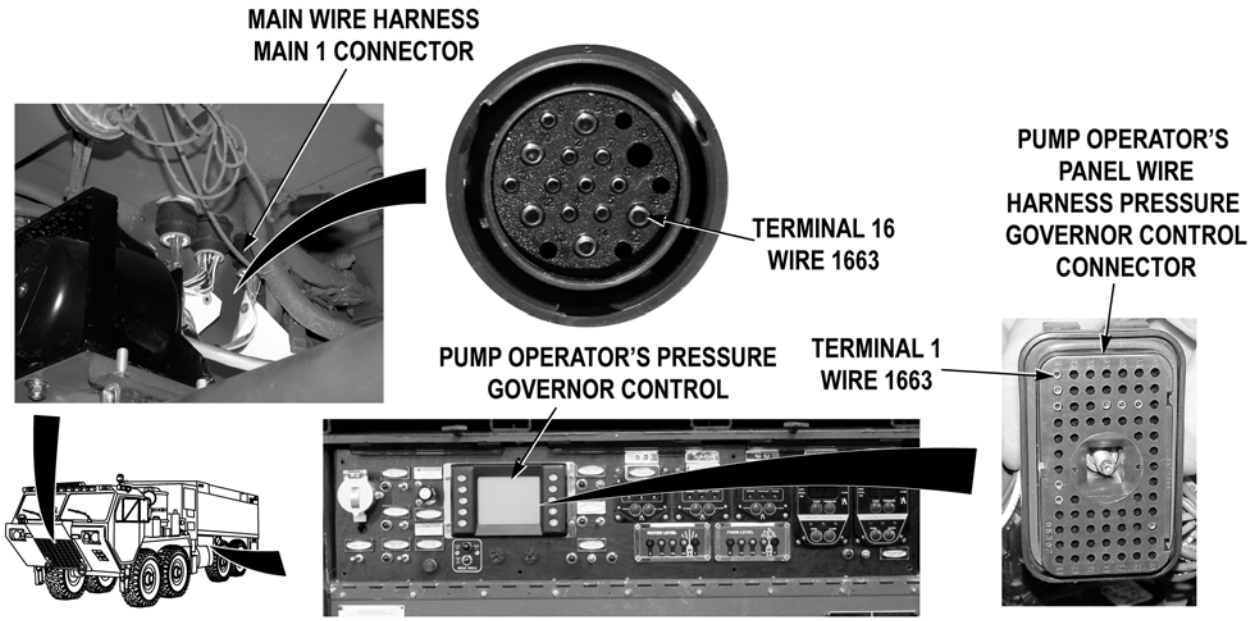
b. If there is no continuity, repair wire 2839 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 98. With a test lead set, check for continuity across main wire harness wire 1640 (black) from main wire harness cab pressure governor control connector, terminal 2 to a known good ground.

a. If there is continuity, replace cab pressure governor control (WP 0195).

b. If there is no continuity, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

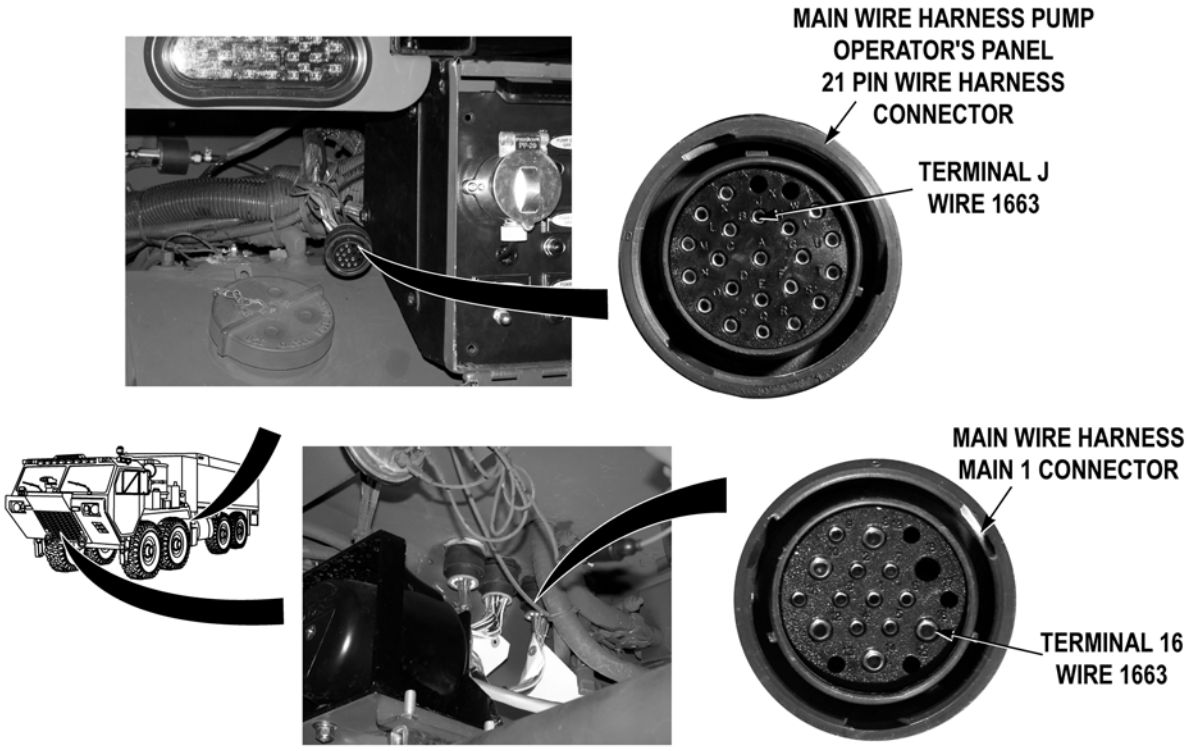
Step 99. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness pressure governor control connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between wire 1663 (black) at pump operator's panel wire harness pressure governor control connector, terminal 1 and a known good ground.

If 22 to 28 VDC are present, go to Step 102.

Step 100. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 1663 (black) from main wire harness main 1 connector, terminal 16 to pump house wire harness pressure governor control connector, terminal 1.

If there is continuity, repair wire 1663 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 101. Disconnect main wire harness pump operator's panel 21 pin connector. With a test lead set, check for continuity across main wire harness wire 1663 (black) from main wire harness main 1 connector, terminal 16 to main wire harness pump operator's panel 21 pin connector, terminal J.

a. If there is continuity, repair wire 1663 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 1663 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 102. With a test lead set, check for 22 to 28 VDC between wire 2839 (white) at pump operator's panel wire harness pressure governor control connector, terminal 3 and a known good ground.

If 22 to 28 VDC are present, go to Step 105.

Step 103. Pull battery disconnect switch to off position (WP 0004). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between wire 2839 (white) at main wire harness pump operator's panel wire harness 21 pin connector, terminal C and a known good ground.

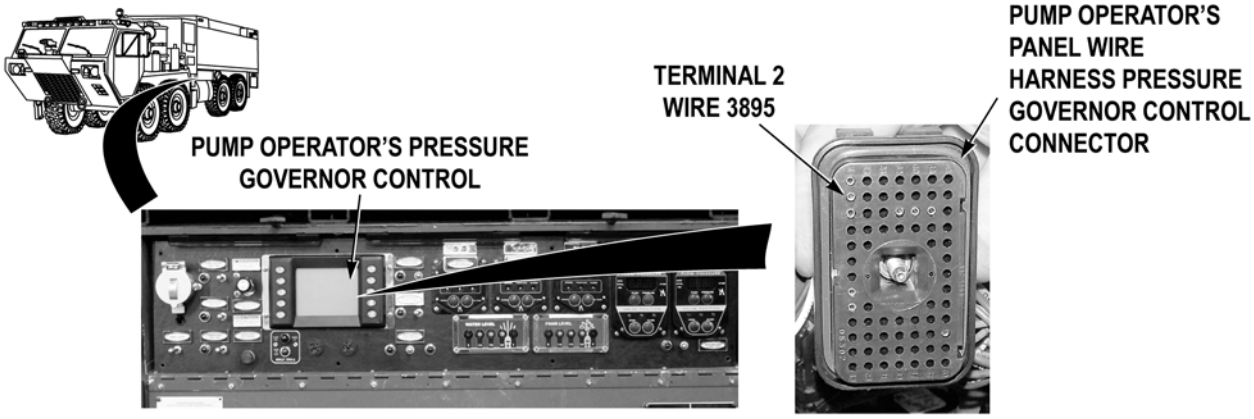
If 22 to 28 VDC are present, repair wire 2839 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 104. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 2839 (white) from main wire harness main 2 connector, terminal M to main wire harness pump operator's panel 21 pin connector, terminal C.

a. If there is continuity, repair wire 2839 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 2839 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

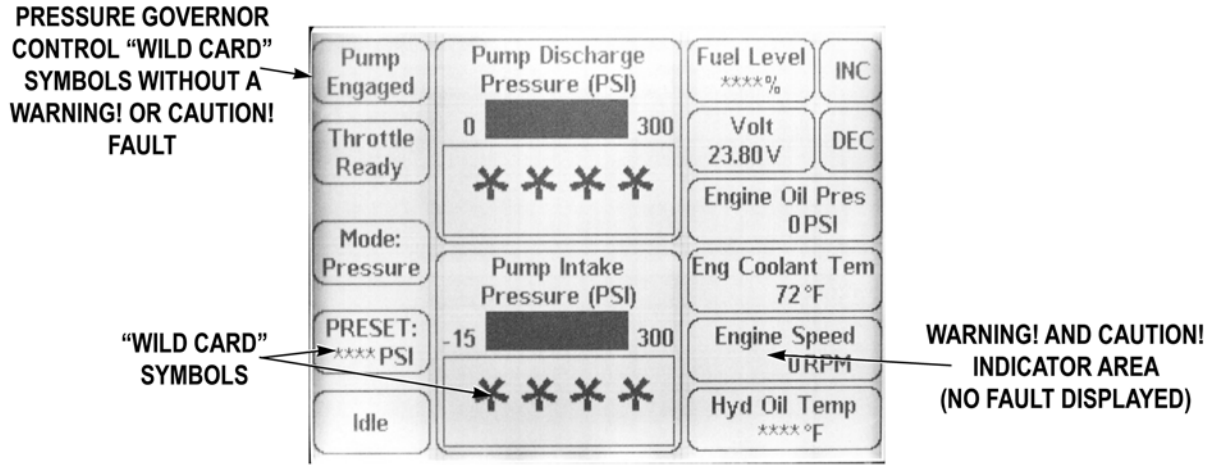
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 105. With a test lead set, check for continuity across main wire harness wire 3895 (black) from pump operator's panel wire harness pressure governor control connector, terminal 2 to a known good ground.

a. If there is continuity, replace cab pressure governor control (WP 0195).

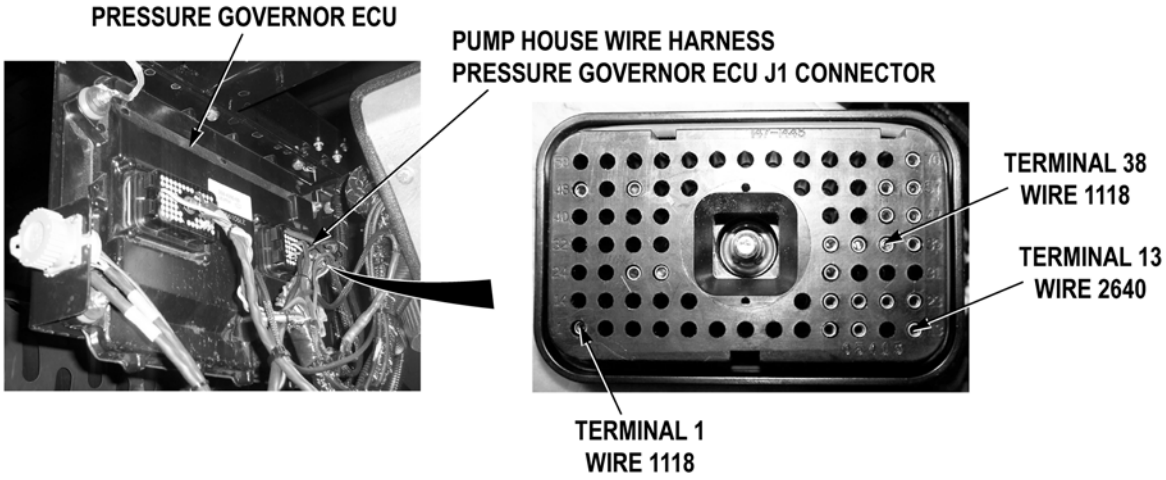
b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).



Step 106. Check if cab or pump operator's panel pressure governor controls display four "wild card" symbols without displaying a WARNING! or CAUTION! fault.

If pressure governor controls do not display four "wild card" symbols without a WARNING! or CAUTION! fault, go to Step 123.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

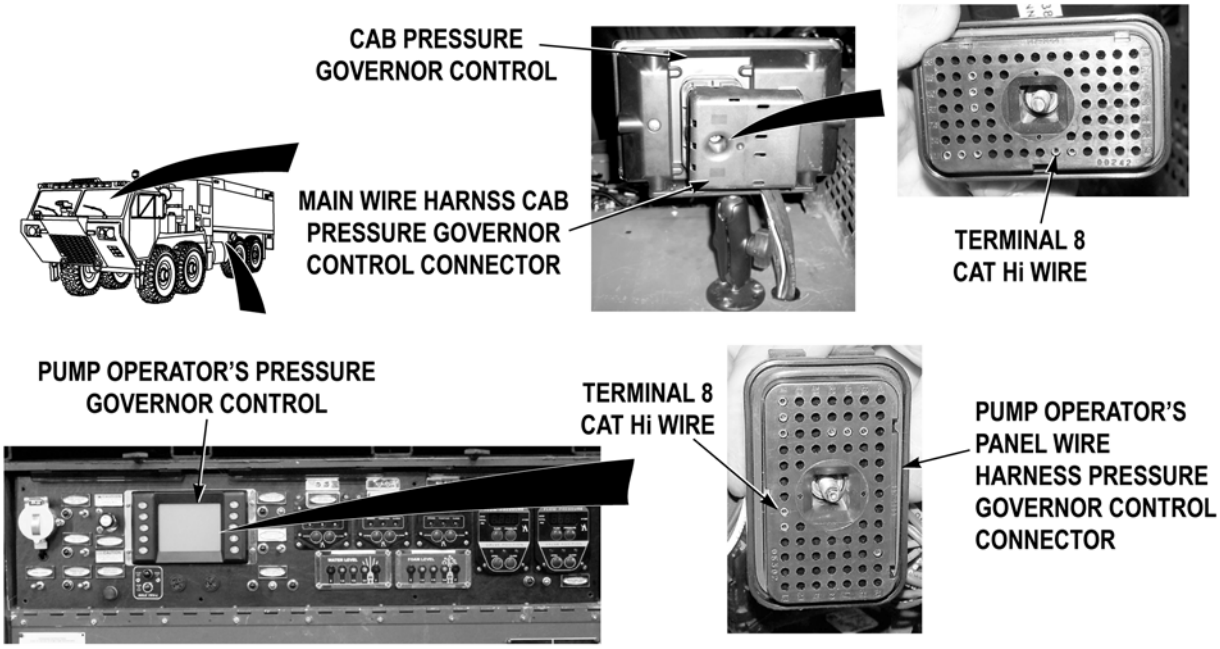
Step 107. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness pressure governor ECU J1 connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 1118 (red) at pump house wire harness pressure governor ECU J1 connector, terminals 1 and 38 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1118 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 108. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2640 (black) from pump house wire harness pressure governor ECU J1 connector, terminal 13 and a known good ground.

If there is no continuity, repair wire 2640 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

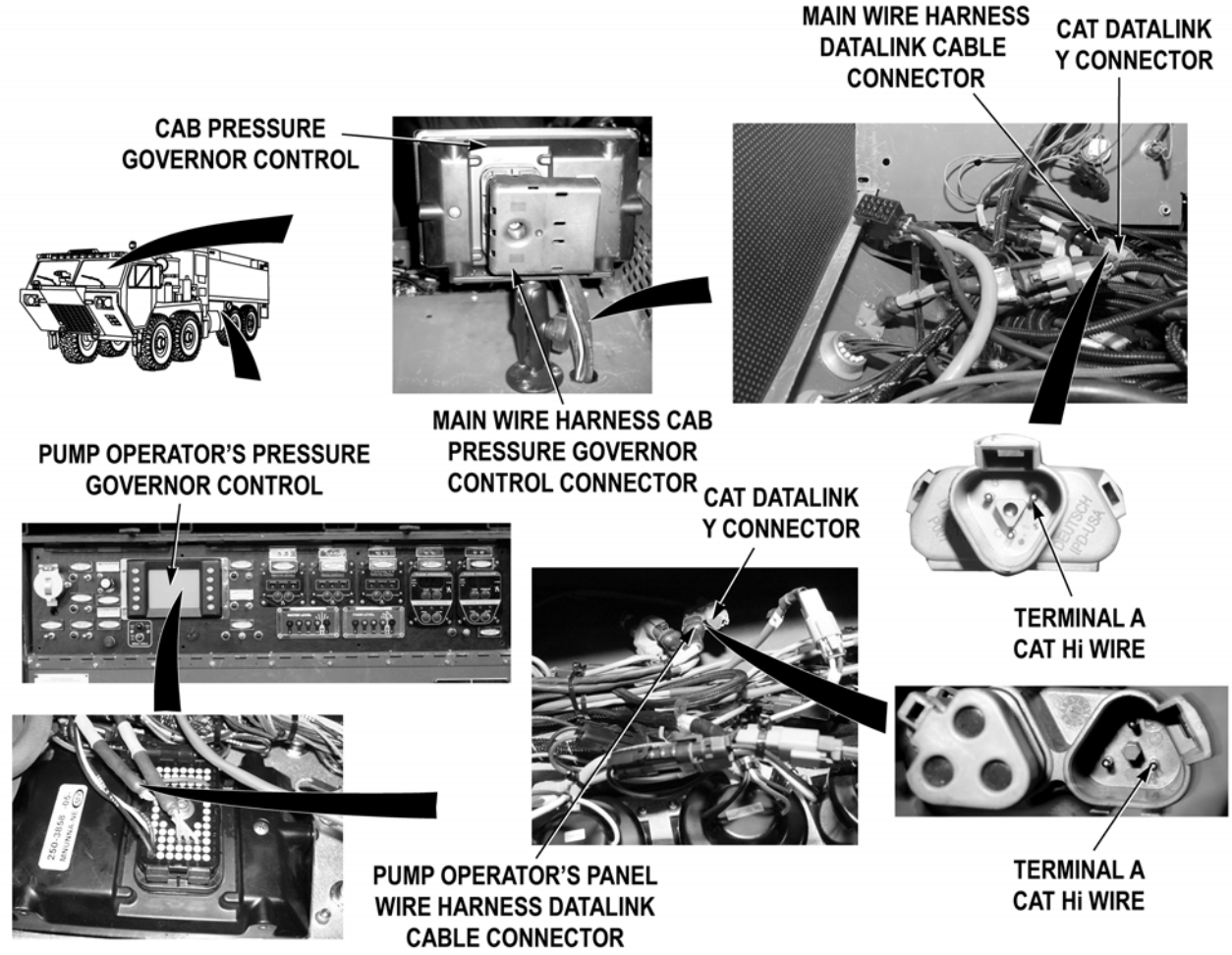
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 109. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness pressure governor control connector. Disconnect main wire harness cab pressure governor control connector. With a test lead set, check for continuity across CAT Hi wire (yellow) from main wire harness cab pressure governor control connector, terminal 8 to pump operator's panel wire harness pressure governor control connector, terminal 8.

If there is continuity, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



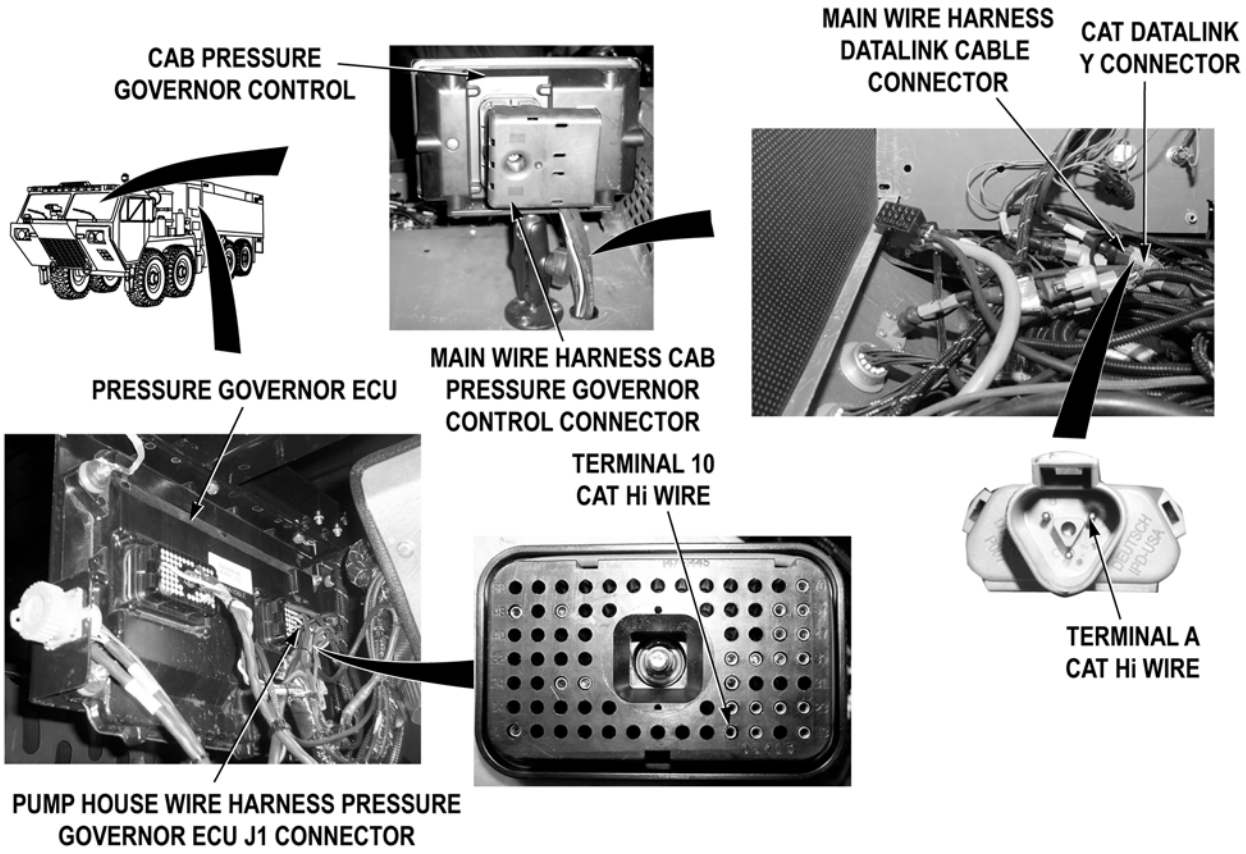
NOTE

- To locate correct datalink cable connector in cab, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.
- To locate correct datalink cable connector in pump operator's panel, follow yellow banded datalink cable from pump operator's panel pressure governor control connector to first Y connector in series.

Step 110. Remove cab instrument panel E (WP 0341). Disconnect main wire harness datalink cable connector from CAT datalink Y connector. Disconnect pump operator's panel wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal A to CAT datalink cable Y connector (that was disconnected from pump operator's panel wire harness), terminal A.

If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

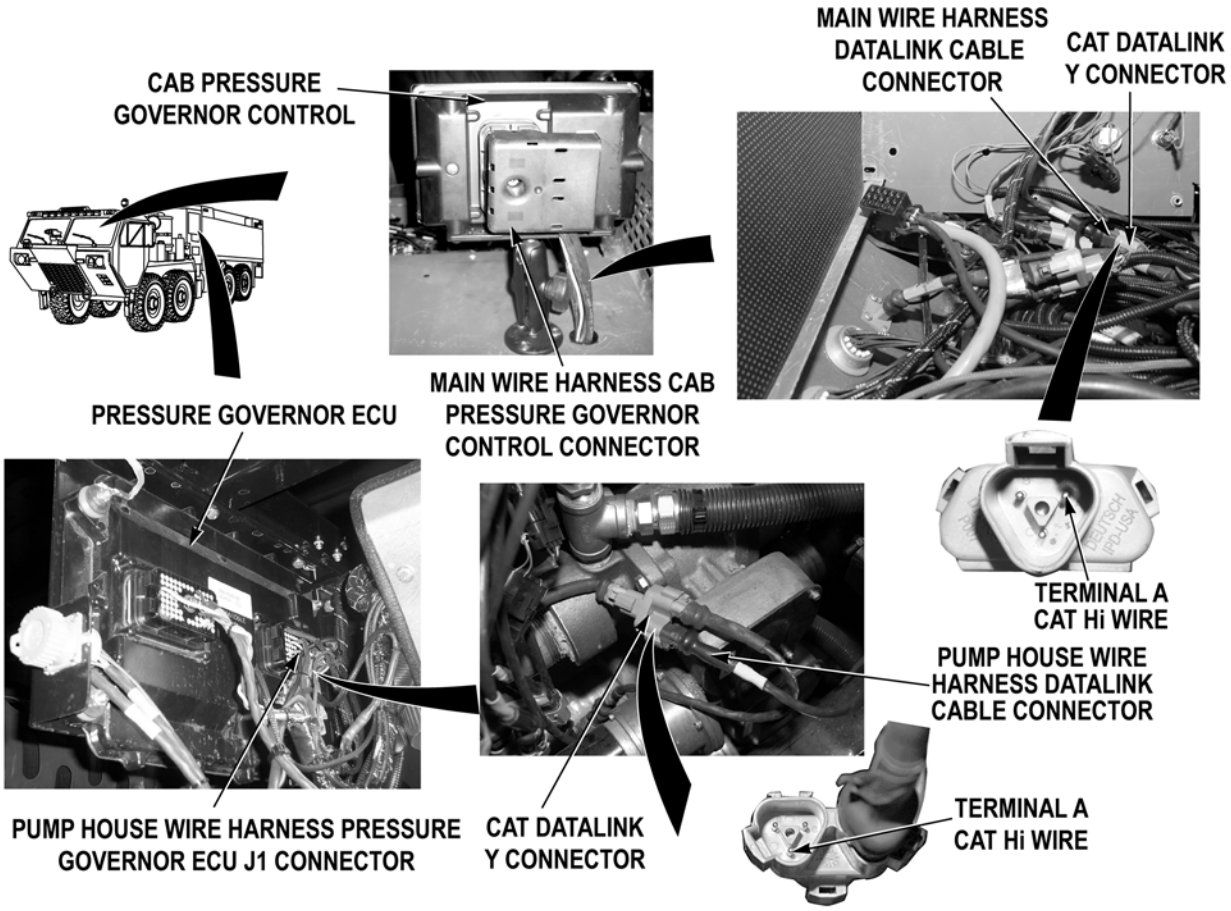
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 111. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal A to pump house wire harness pressure governor ECU J1 connector, terminal 10.

If there is continuity, go to Step 25.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

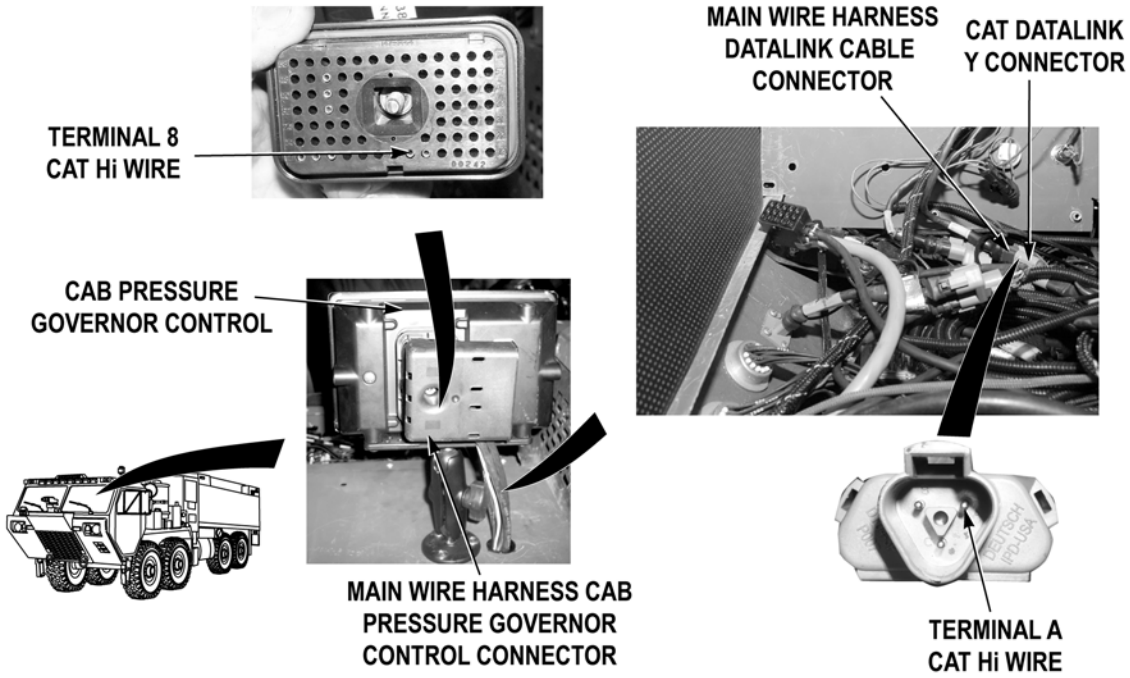
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 112. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal A to CAT datalink cable Y connector (that was disconnected from main wire harness), terminal A.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

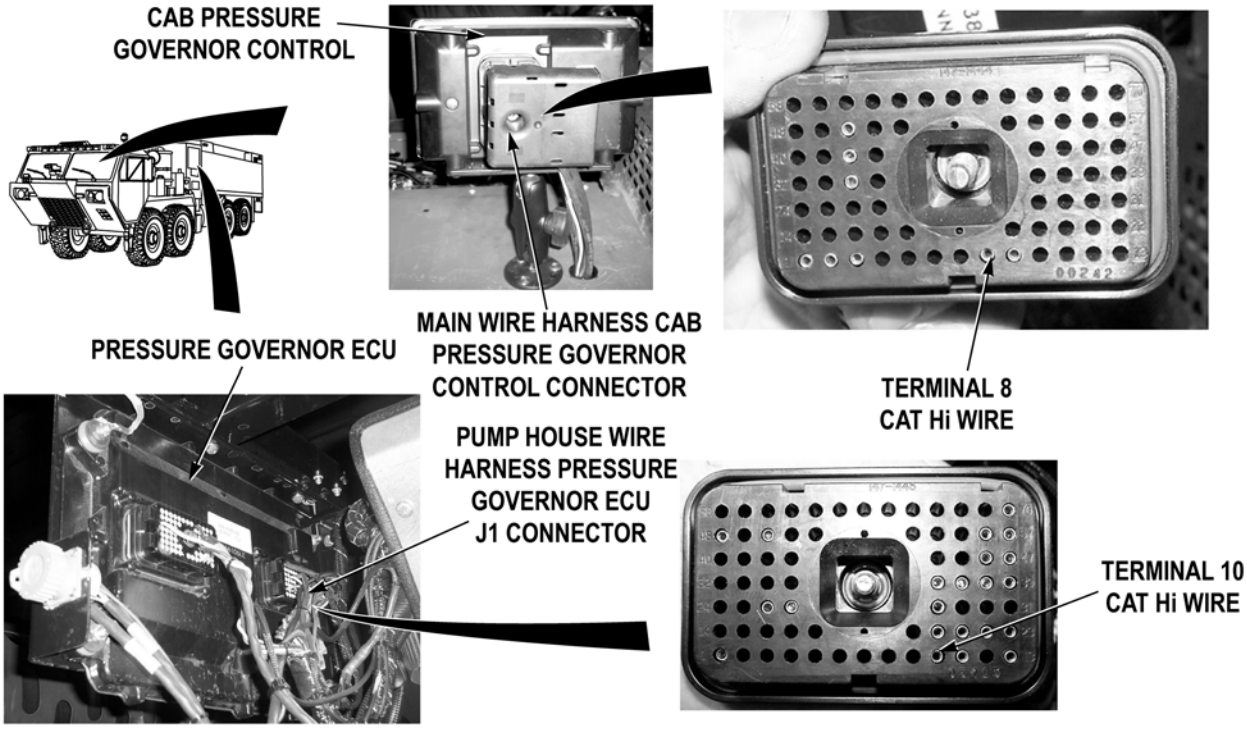


Step 113. With a test lead set, check for continuity across main wire harness CAT Hi wire (yellow) from cab pressure governor control connector, terminal 8 to main wire harness datalink cable connector, terminal A.

a. If there is continuity, repair pump operator's panel datalink cable if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair main wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



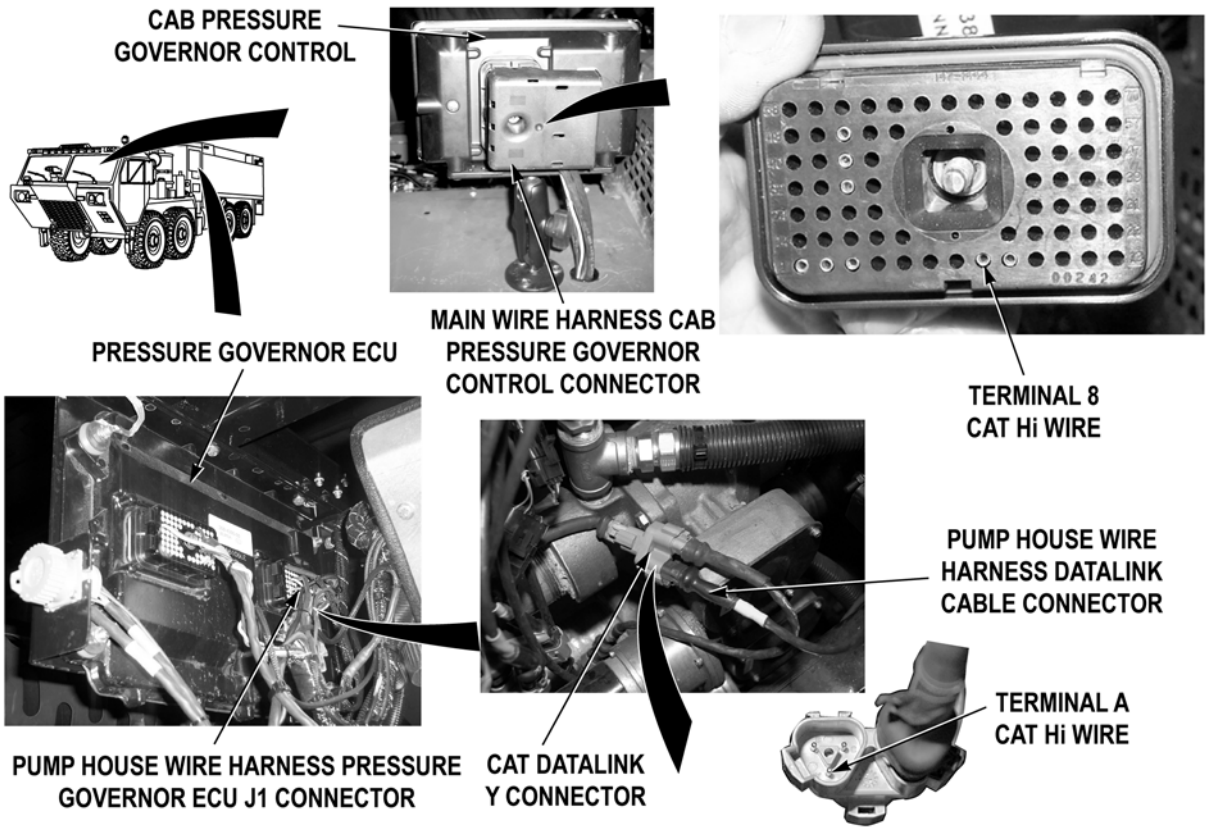
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 114. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across CAT Hi wire (yellow) from main wire harness cab pressure governor control connector, terminal 8 to pump house wire harness pressure governor ECU J1 connector, terminal 10.

If there is continuity, go to Step 28.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

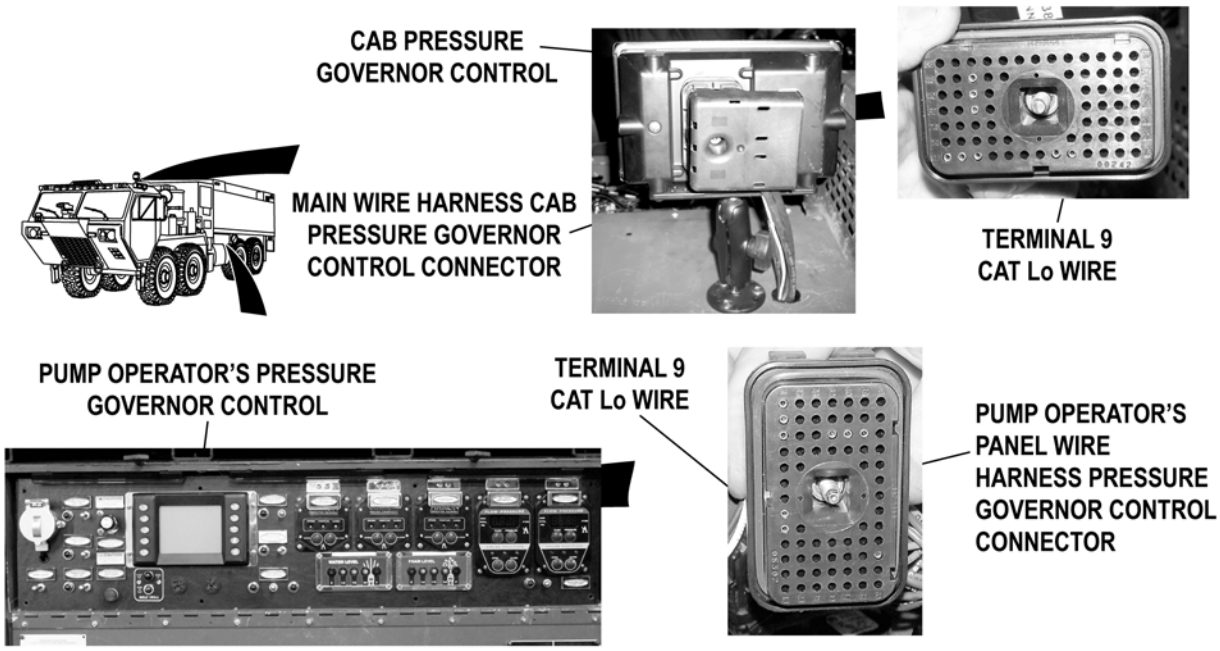
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from pressure governor ECU connector to first Y connector in series.

Step 115. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Hi wire (yellow) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal A to main wire harness cab pressure governor control connector, terminal 8.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

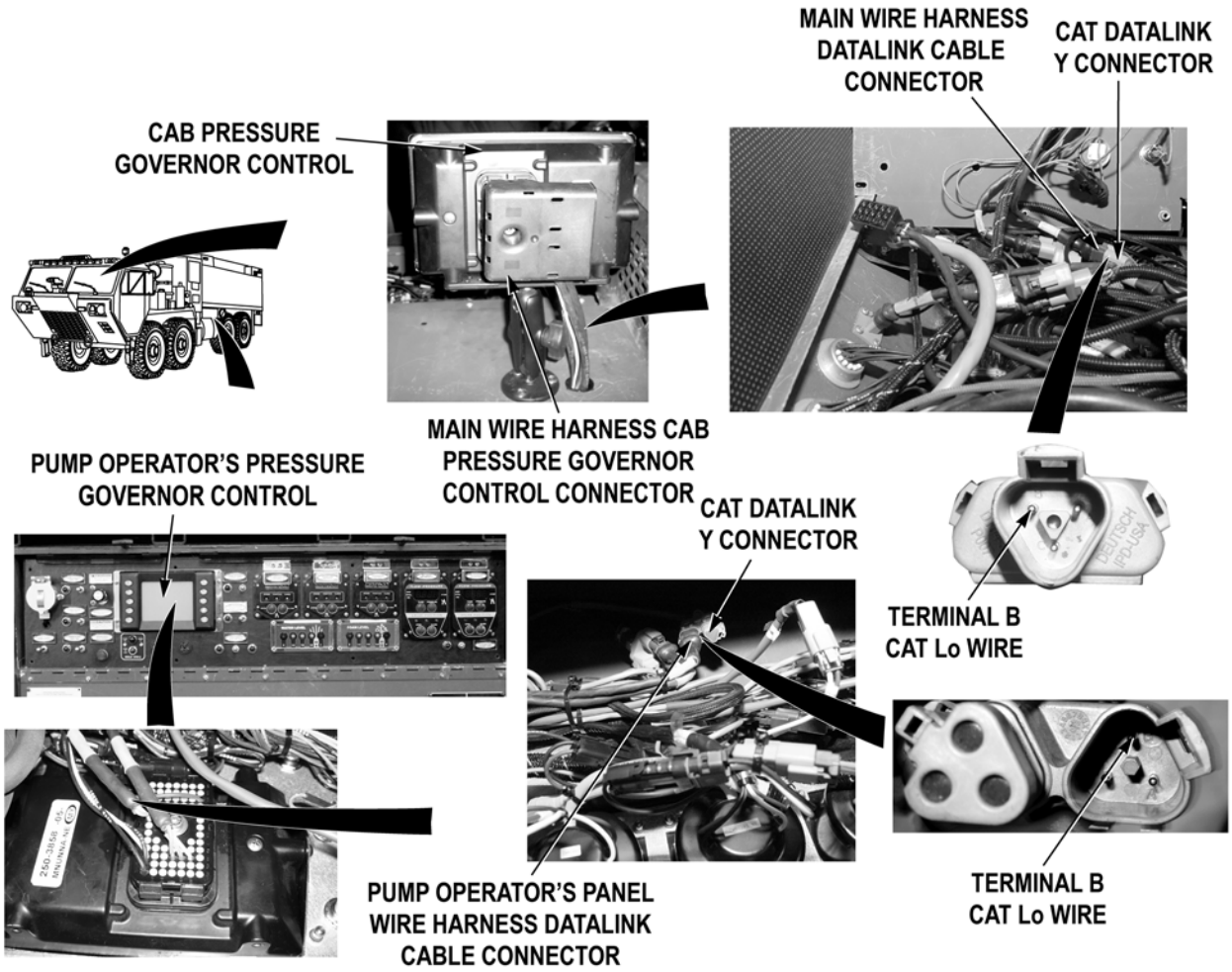
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 116. With a test lead set, check for continuity across CAT Lo wire (green) from main wire harness cab pressure governor control connector, terminal 9 to pump operator's panel pressure governor control connector, terminal 9.

If there is continuity, go to Step 33.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



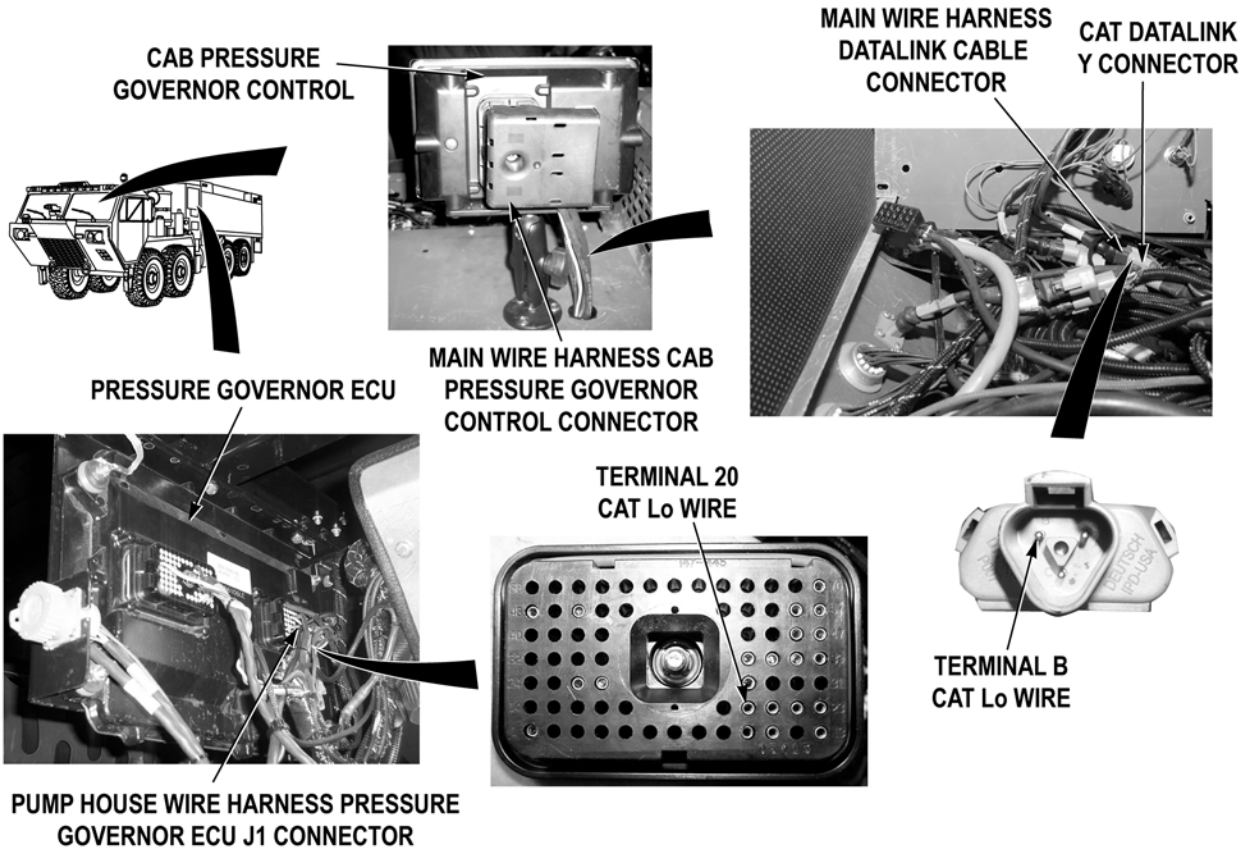
NOTE

- To locate correct datalink cable connector in cab, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.
- To locate correct datalink cable connector in pump operator's panel, follow yellow banded datalink cable from pump operator's panel pressure governor control connector to first Y connector in series.

Step 117. Remove cab instrument panel E (WP 0341). Disconnect main wire harness datalink cable connector from CAT datalink Y connector. Disconnect pump operator's panel wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal B to CAT datalink cable Y connector (that was disconnected from pump operator's panel wire harness), terminal B.

If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

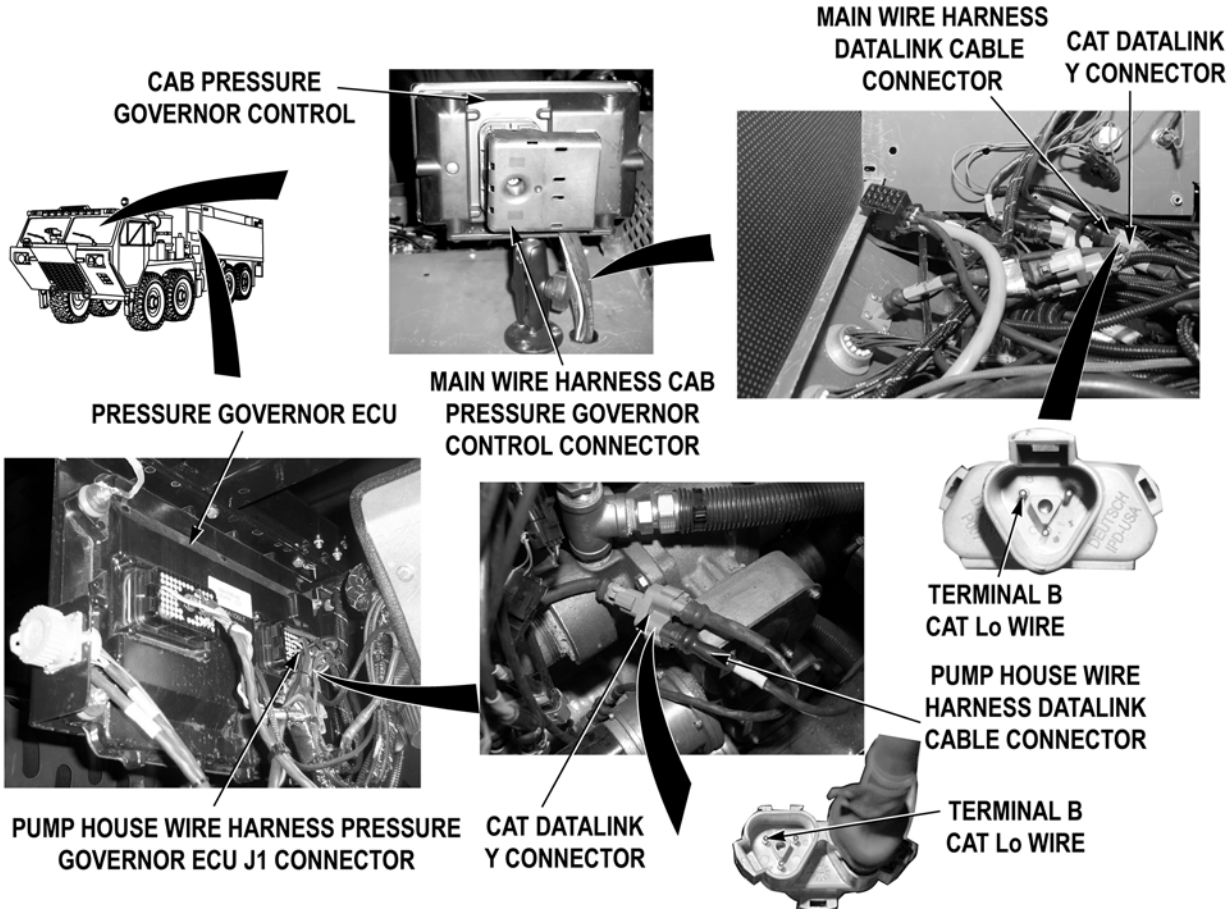
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 118. With a test lead set, check for continuity across CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from main wire harness), terminal B to pump house wire harness pressure governor ECU J1 connector, terminal 20.

If there is continuity, go to Step 32.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

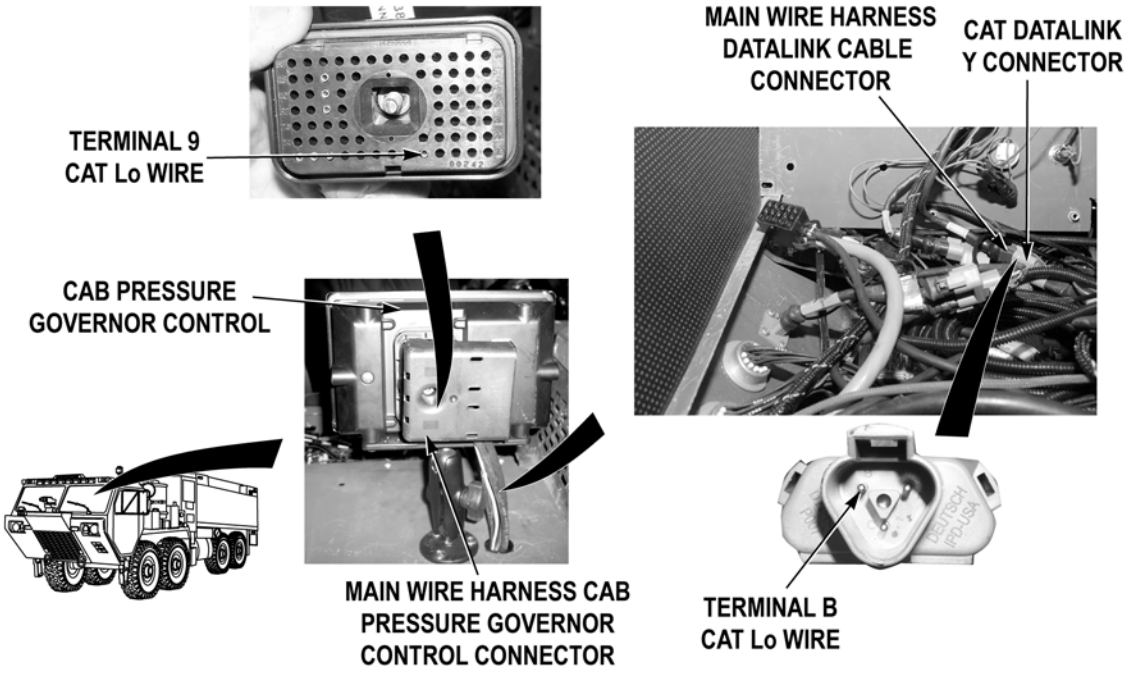
To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.

Step 119. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal B to CAT datalink cable Y connector (that was disconnected from main wire harness), terminal B.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

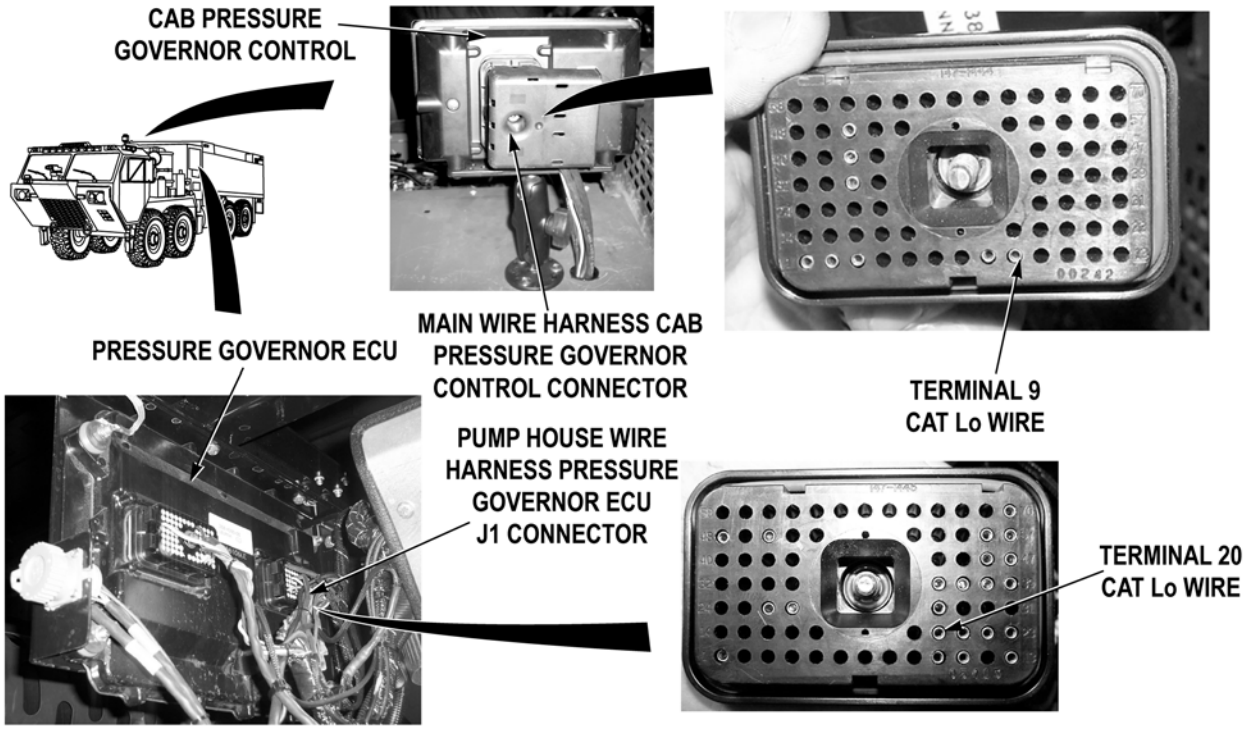


Step 120. With a test lead set, check for continuity across main wire harness CAT Lo wire (green) from cab pressure governor control connector, terminal 9 to main wire harness datalink cable connector, terminal B.

a. If there is continuity, repair pump operator's panel datalink cable if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair main wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



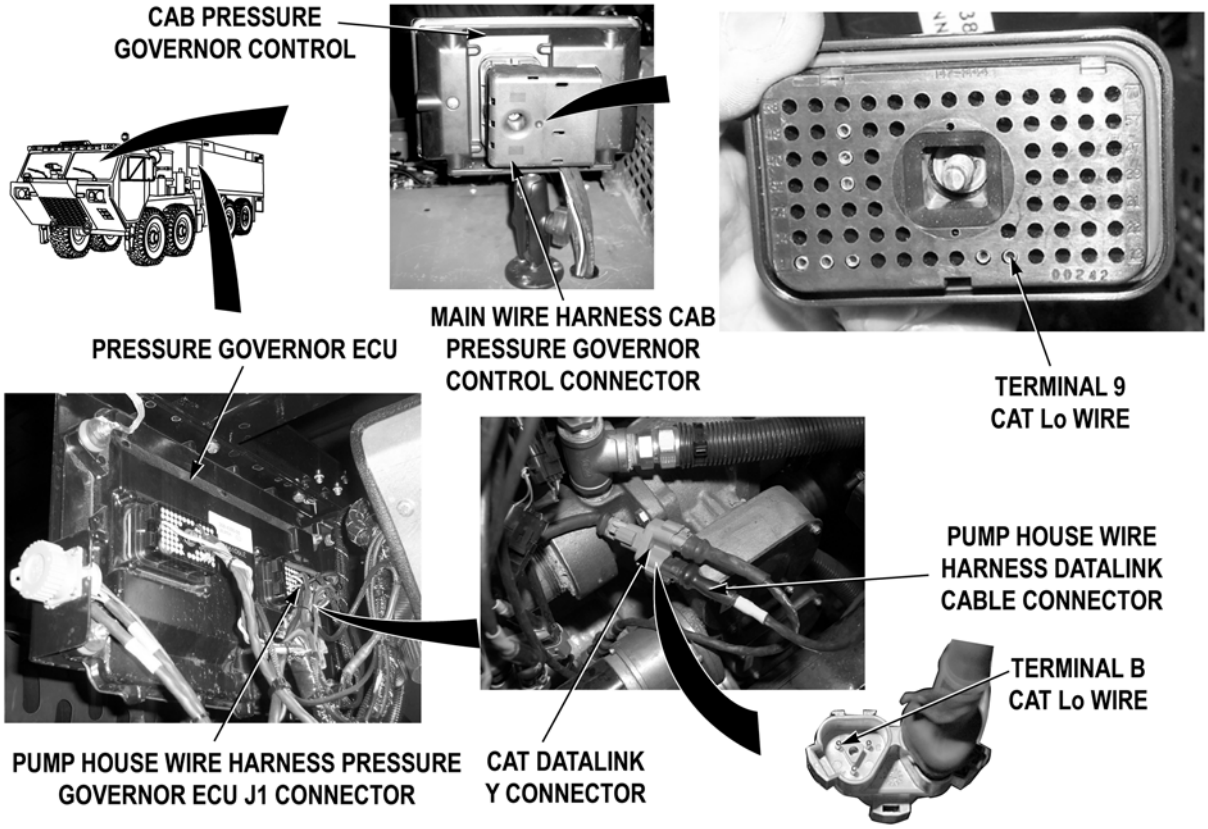
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 121. Disconnect pump house wire harness pressure governor ECU J1 connector. With a test lead set, check for continuity across CAT Lo wire (green) from main wire harness cab pressure governor control connector, terminal 9 to pump house wire harness pressure governor ECU J1 connector, terminal 20.

If there is continuity, replace pressure governor ECU (WP 0289).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

To locate correct datalink cable connector in pump house, follow yellow banded datalink cable from main wire harness cab pressure governor control connector to first Y connector in series.

Step 122. Disconnect pump house wire harness datalink cable connector from CAT datalink Y connector. With a test lead set, check for continuity across CAT datalink cable CAT Lo wire (green) from CAT datalink cable Y connector (that was disconnected from pump house wire harness), terminal B to main wire harness cab pressure governor control connector, terminal 9.

a. If there is continuity, repair pump house wire harness datalink cable if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is no continuity, replace CAT datalink wire harness (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

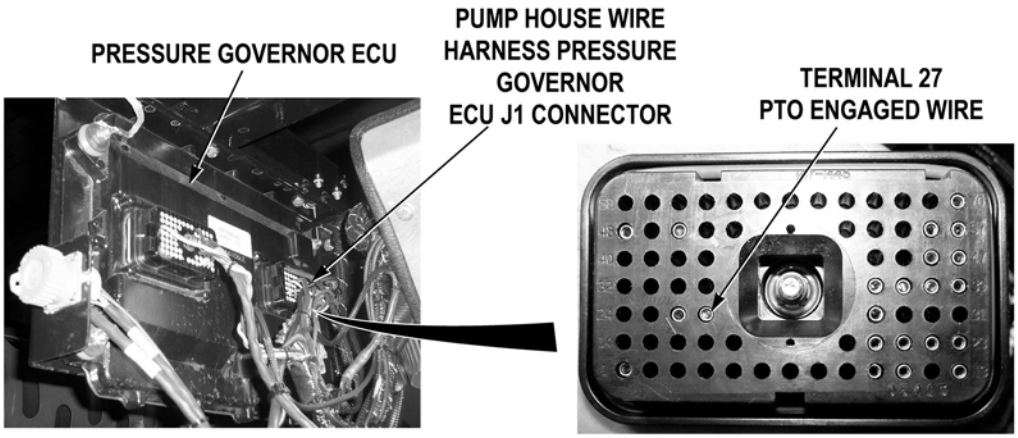
WARNING

Stay clear of rotating PUMP PTO drive shaft. Clothing or other material may catch on rotating PUMP PTO drive shaft, causing damage to equipment or serious injury or death to personnel.

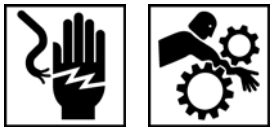
Step 123. While an assistant puts PUMP PTO switch to on position (WP 0004), check if pressure governor control displays Pump Engaged.

If pressure governor control displays Pump Engaged, go to Step 125.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING



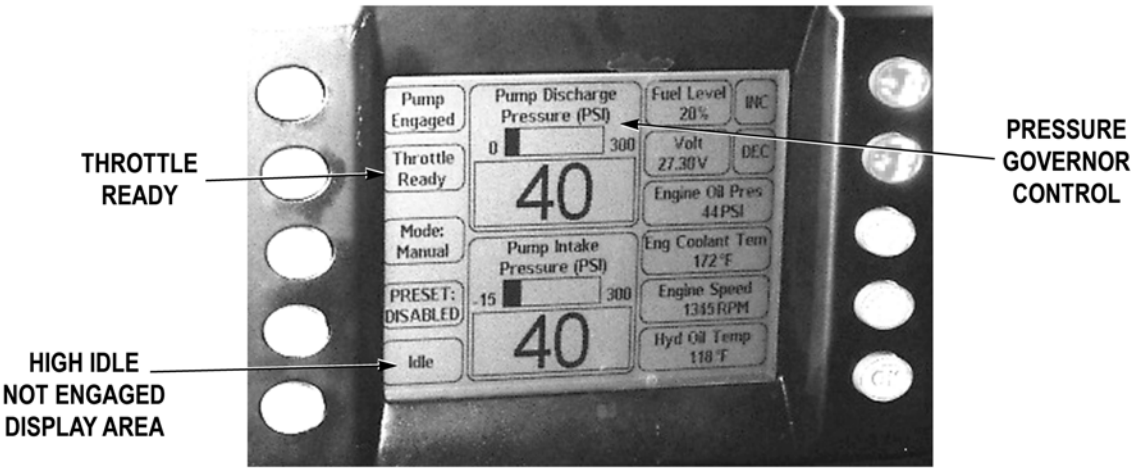
- **Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.**
- **Stay clear of rotating PUMP PTO drive shaft. Clothing or other material may catch on rotating PUMP PTO drive shaft, causing damage to equipment or serious injury or death to personnel.**

Step 124. Put PUMP PTO switch to off position (WP 0004). Turn engine off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness pressure governor ECU J1 connector. Push battery disconnect switch to on position (WP 0007). Start engine (TM 9-2320-279-10). While an assistant puts PUMP PTO switch to on position (WP 0004), with a test lead set, check for continuity across pump house wire harness PTO engage wire at pressure governor ECU J1 connector, terminal 27 and a known good ground.

a. If there is continuity, replace pressure governor ECU (WP 0289).

b. If there is continuity, troubleshoot PUMP PTO ENGAGED Indicator Does Not Illuminate (Cab) (WP 0094).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



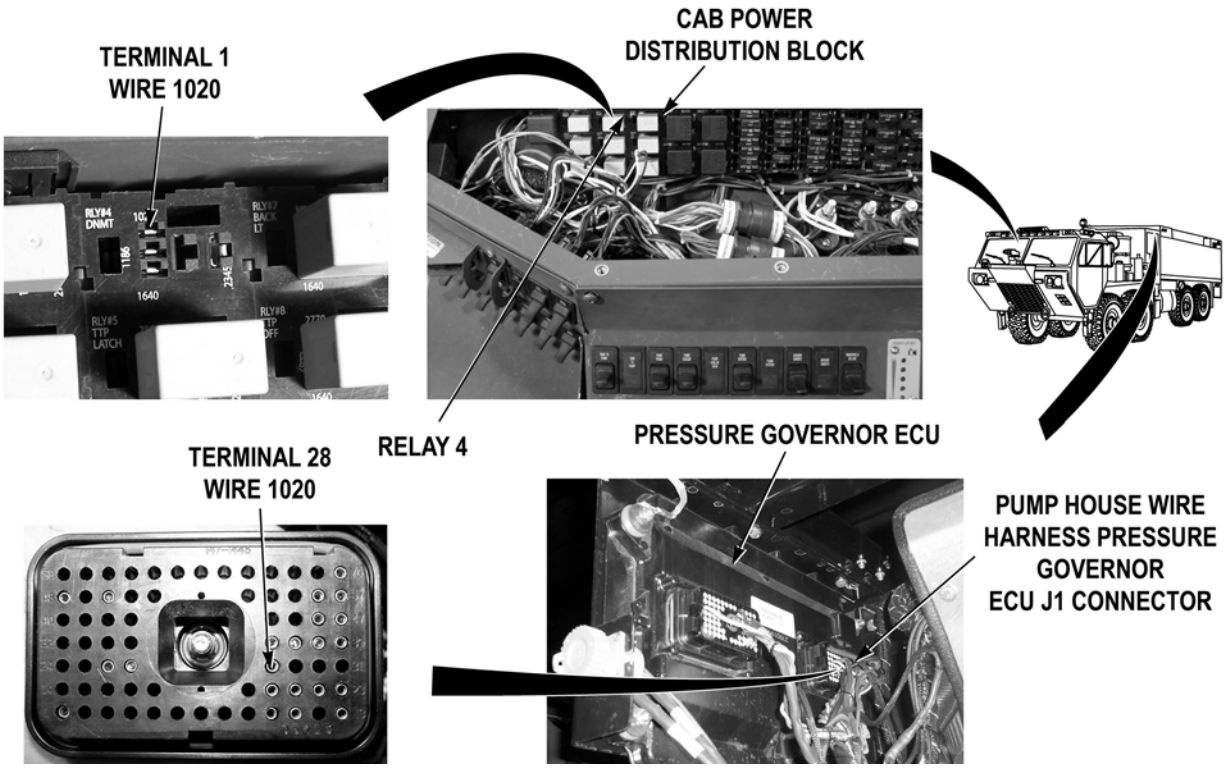
Step 125. Put HIGH IDLE switch to ON position (WP 0004). Check if pressure governor control displays High Idle Not Engaged indicator.

If High Idle Not Engaged is displayed, troubleshoot Tachometer Does Not Operate (TM 9-2320-315-14&P).

Step 126. Check if pressure governor control displays Throttle Ready indicator.

If pressure governor control displays Throttle Ready indicator, go to Step 128.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 127. Put HIGH IDLE switch to OFF position (WP 0004). Put PUMP PTO switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Disconnect pump house wire harness pressure governor ECU J1 connector. Remove cab instrument panel A (WP 0203). Remove Relay 4 from cab power distribution block (WP 0242). Check for continuity across parking brake signal wire 1020 (black) from cab power distribution block relay 4 connector, terminal 1 to pump house wire harness pressure governor ECU J1 connector, terminal 28.

a. If there is continuity, troubleshoot Check For Open Compartment Doors When Light Is On Indicator Does Not Operate Properly (WP 0087).

b. If there is no continuity, repair wire 1020 if repairable (TM 9-2320-315-14&P), or replace parking brake signal wire.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

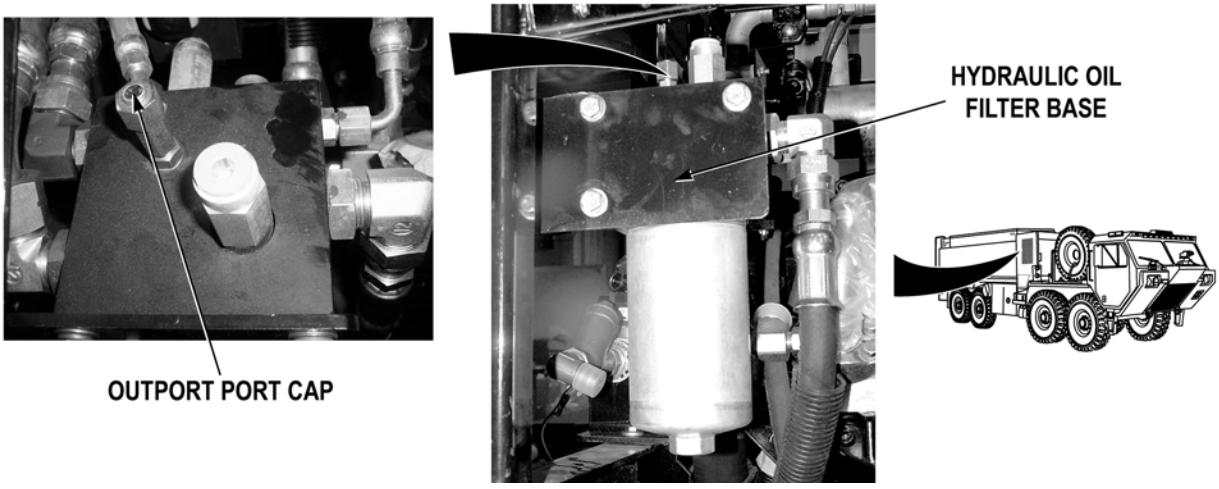
WARNING

- **With hydraulic system in manual mode, fire apparatus can reach water pressure limits beyond parameters guarded by pressure governor controls. Use extreme care to ensure that manual pressure control knob is in full decrease position unless directed to position manual controls otherwise. Failure to comply may cause injury or death to personnel.**
- **If soft suction discharge hose is connected to either side discharges, disconnect hose and fully close discharge valves before proceeding to Step 128. Failure to comply may cause injury or death to personnel.**
- **If REEL DISCHARGE switch is in open position, put switch to CLOSED position (WP 0004) before proceeding to Step 128. Failure to comply may cause injury or death to personnel.**

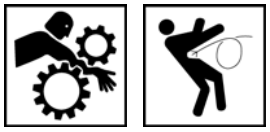
Step 128. Put manual pressure control knob to full DEC (counterclockwise) position (WP 0004). Put manual override manifold hydraulic override lever to manual mode (WP 0004). Slowly rotate manual pressure control knob clockwise in INC position (WP 0004), check if pressure governor control Pump Discharge Pressure (PSI) displays pressure (WP 0016).

If pressure governor control Pressure Discharge Pressure (PSI) displays pressure, replace manual override manifold (WP 0140).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

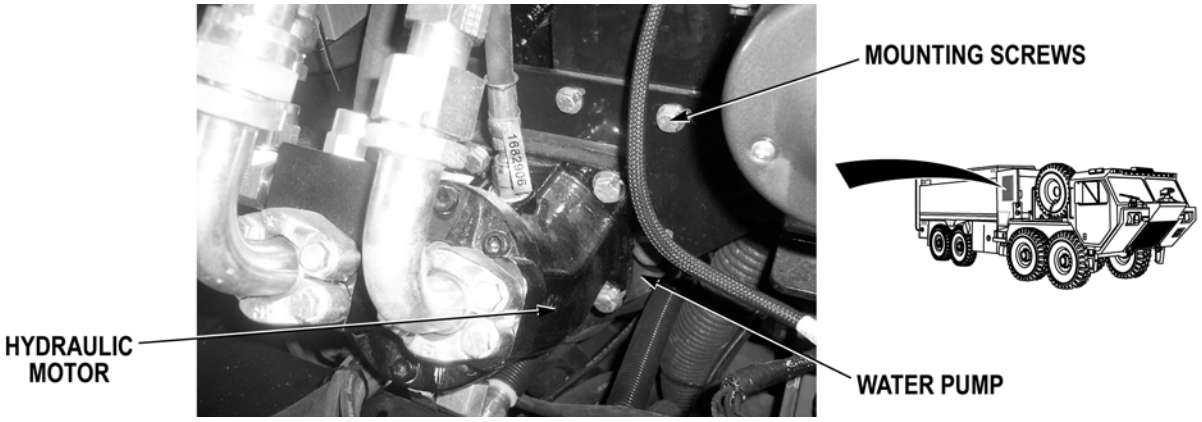


- **Stay clear of rotating PUMP PTO drive shaft. Clothing or other material may catch on rotating PUMP PTO drive shaft, causing damage to equipment or serious injury or death to personnel.**
- **Never work on hydraulic systems or equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and can give first aid. Failure to comply may result in injury or death to personnel.**
- **Never disconnect any hydraulic hose or part while the engine is running. Allow several minutes to elapse after shutting off engine, to allow pressure to relieve itself, before attempting to remove hoses. Failure to comply may result in injury or death to personnel.**

Step 129. Put manual pressure control knob to full DEC (counterclockwise) position (WP 0004). Put HIGH IDLE switch to OFF position (WP 0004). Put PUMP PTO switch to OFF position (WP 0004). Turn Engine Off (TM 9-2320-279-10). Remove pump house panel H (WP 0341). Remove cap from hydraulic oil filter base output port. Install hydraulic pressure gauge on hydraulic oil filter base. Start engine (TM 9-2320-279-10). Put PUMP PTO switch to ON position (WP 0004). Put HIGH IDLE switch to ON position (WP 0004). Check if there is 350 PSI (2,414 kPa) to 450 PSI (3,102 kPa) of pressure at hydraulic oil filter base output port.

If there is 350 PSI (2,413 kPa) of pressure at hydraulic oil filter base output port, replace hydraulic charge pump.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Do not remove hydraulic hoses from hydraulic motor in Step 130.

Step 130. Put HIGH IDLE switch to OFF position (WP 0004). Put PUMP PTO switch to OFF position (WP 0004). Turn Engine Off (TM 9-2320-279-10). Remove hydraulic pressure gauge and install caps on hydraulic oil filter base input and output ports. Remove four mounting screws and nuts from hydraulic motor and water pump (WP 0149) Pull hydraulic motor away from water pump. Start engine (TM 9-2320-279-10). Put PUMP PTO switch to ON position (WP 0004). Put HIGH IDLE switch to ON position (WP 0004). While an assistant rotates manual pressure control knob ¼ a turn clockwise in INC position (WP 0004), check if hydraulic motor output shaft turns.

If hydraulic motor output shaft turns, replace water pump (WP 0156).

Step 131. Replace hydraulic motor (WP 0149). Start engine (TM 9-2320-279-10). Put PUMP PTO switch to ON position (WP 0004). Put HIGH IDLE switch to ON position (WP 0004). Put manual override manifold hydraulic override lever to automatic mode (WP 0004). Check if pressure governor control Pressure Discharge Pressure (PSI) displays pressure (WP 0016).

a. If pressure governor control Pressure Discharge Pressure (PSI) displays pressure, fault corrected.

b. If pressure governor control Pressure Discharge Pressure (PSI) does not display pressure, replace hydrostatic pump (WP 0016).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP PRIMING SYSTEM DOES NOT OPERATE PROPERLY

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0009
WP 0017
WP 0024
WP 0036
WP 0163
WP 0166
WP 0167
WP 0197
WP 0203

References (continued)
WP 0205
WP 0217
WP 0220
WP 0240
WP 0250
WP 0254
WP 0280
WP 0281
WP 0293
WP 0300
WP 0301
WP 0302
WP 0303
WP 0304
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PUMP PRIMING SYSTEM DOES NOT OPERATE PROPERLY

NOTE

Primer pump operation can be checked by noting the loud and distinguishable audible vibration of primer pump.

Step 1. Push battery disconnect switch to on position (WP 0007). Prepare vehicle to pump from draft (WP 0017). Press pump operator's panel DRIVER MAIN INLET PRIMER button (WP 0004). Check for primer pump operation.

If primer pump does not operate when pump operator's panel DRIVER MAIN INLET PRIMER button is pressed, go to Step 6.

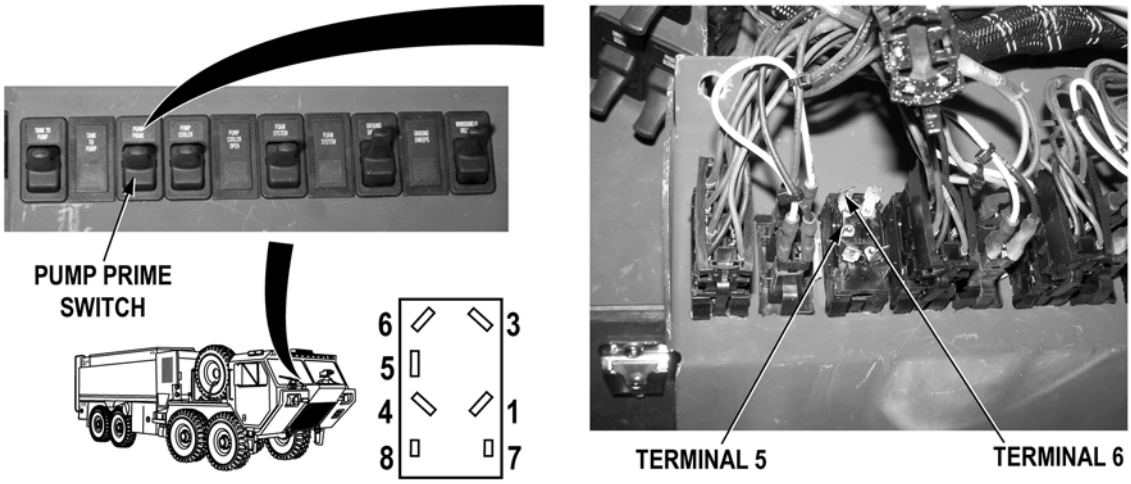
Step 2. Push pump operator's panel DRIVER MAIN INLET PRIMER button (WP 0004). Check if primer pump draws water to water pump (WP 0017).

If primer pump operates but does not draw water to water pump, go to Step 26.

Step 3. Put cab PUMP PRIME switch to on position (WP 0004). Check if primer pump operates.

If primer pump operates, fault corrected.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



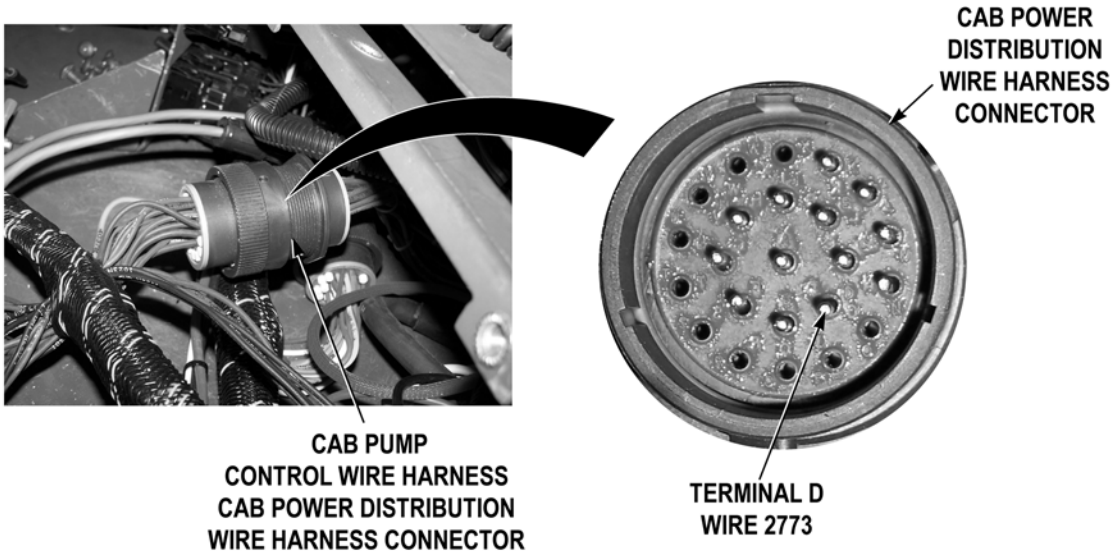
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness PUMP PRIME switch connector. While an assistant holds cab PUMP PRIME switch to on position (WP 0004), check for continuity across cab PUMP PRIME switch from terminal 5 to terminal 6.

If there is no continuity, replace cab PUMP PRIME switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 2773 (red) at cab power distribution wire harness connector, terminal D and a known good ground.

a. If 22 to 28 VDC are present, repair wire 2773 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If 22 to 28 VDC are not present, repair wire 2773 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness (WP 0280).

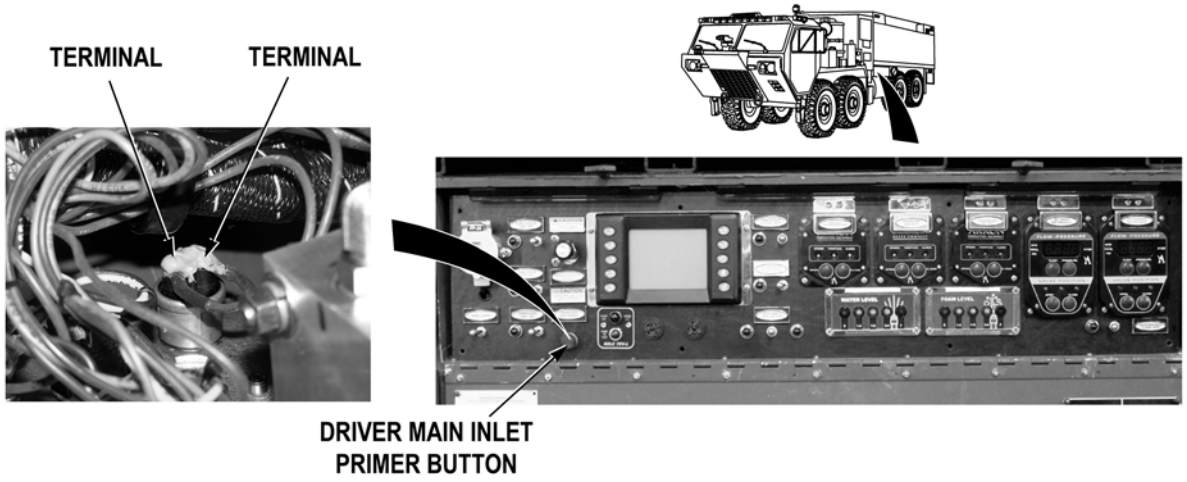
Step 6. Put cab PUMP PRIME switch to on position (WP 0004). Check if primer pump operates.

If primer pump does not operate when cab PUMP PRIME switch is put to on position, go to Step 11.

Step 7. Put cab PUMP PRIME switch to on position (WP 0004). Check if primer pump draws water to water pump.

If primer pump operates but does not draw water to water pump, go to Step 26.

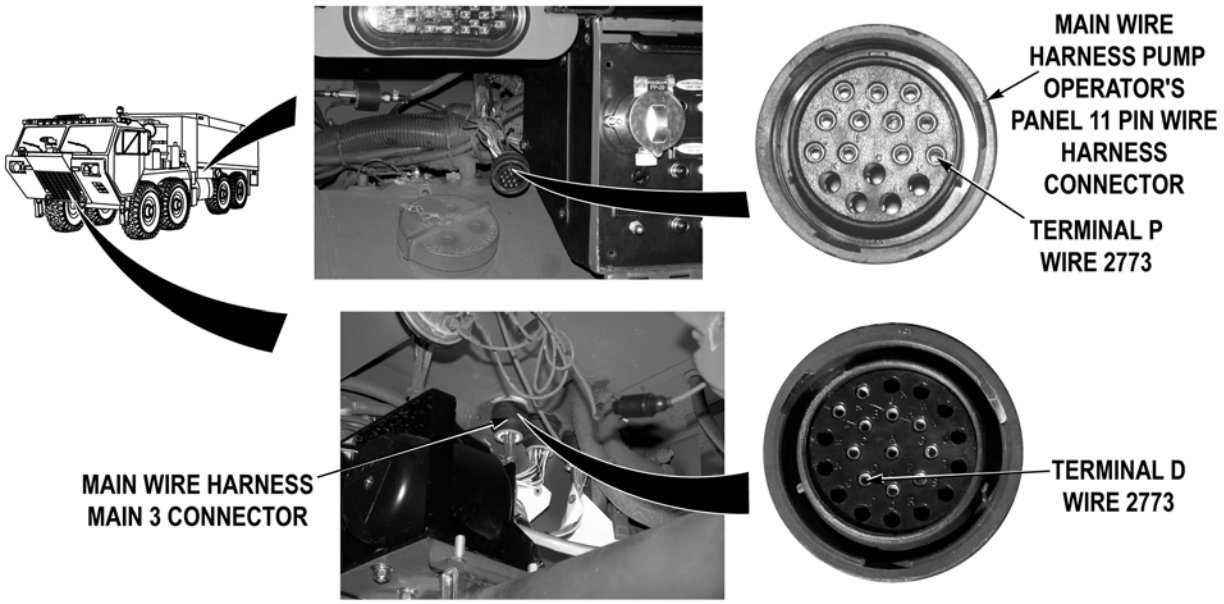
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). While an assistant pushes and holds pump operator's panel DRIVER MAIN INLET PRIMER button to on position (WP 0004), check for continuity across pump operator's panel DRIVER MAIN INLET PRIMER switch from terminal to terminal.

If there is no continuity replace pump operator's panel DRIVER MAIN INLET PRIMER button (WP 0217).

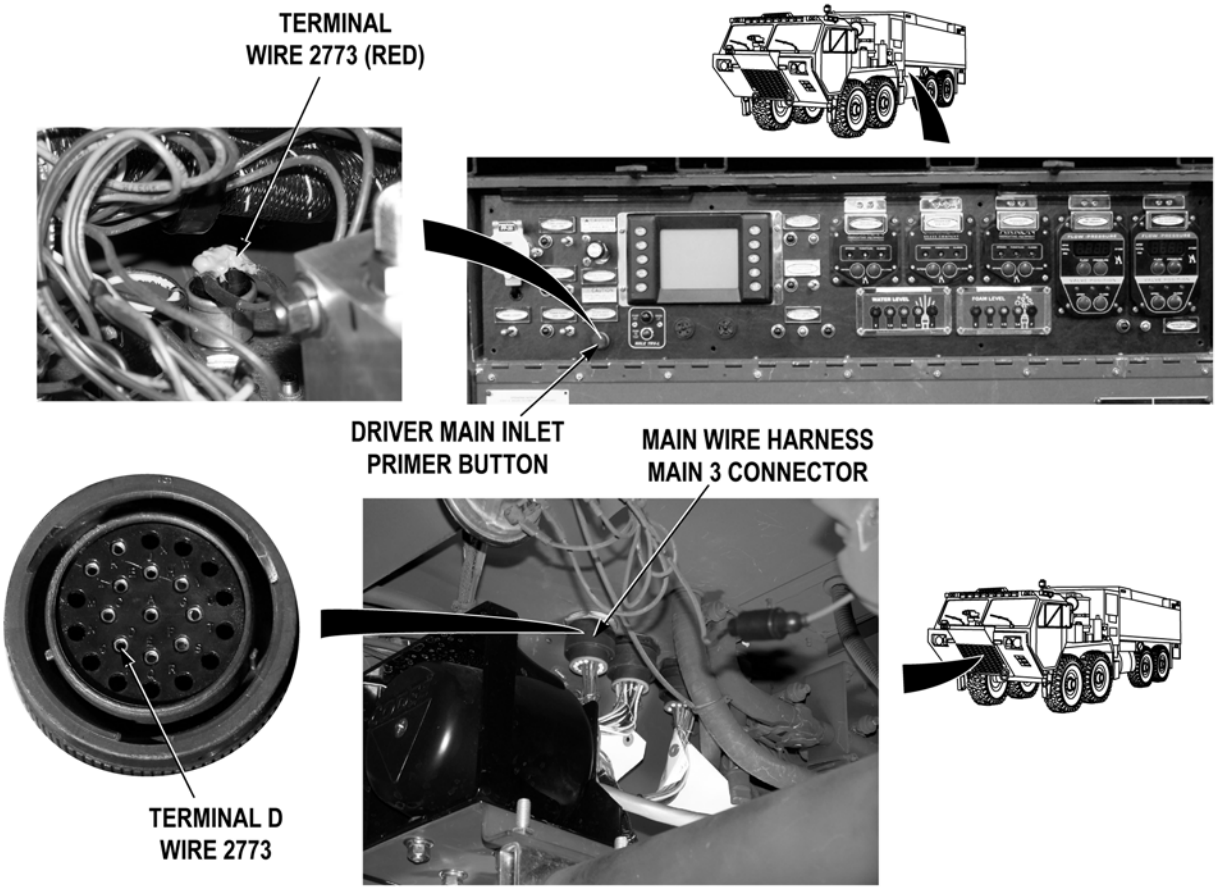
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Remove skid plate grille (WP 0350). Disconnect main wire harness pump operator's panel 11 pin wire harness connector. Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2773 (red), from main wire harness main 3 connector, terminal D to main wire harness pump operator's panel 11 pin wire harness connector, terminal P.

If there is no continuity, repair wire 2773 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Reconnect main wire harness pump operator's panel 11 pin wire harness connector. With a test lead set, check for continuity across pump operator's panel wire harness wire 2773 (red) from pump operator's panel DRIVER MAIN INLET PRIMER button terminal to main wire harness main 3 connector, terminal D.

a. If there is continuity, repair wire 2773 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2773 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

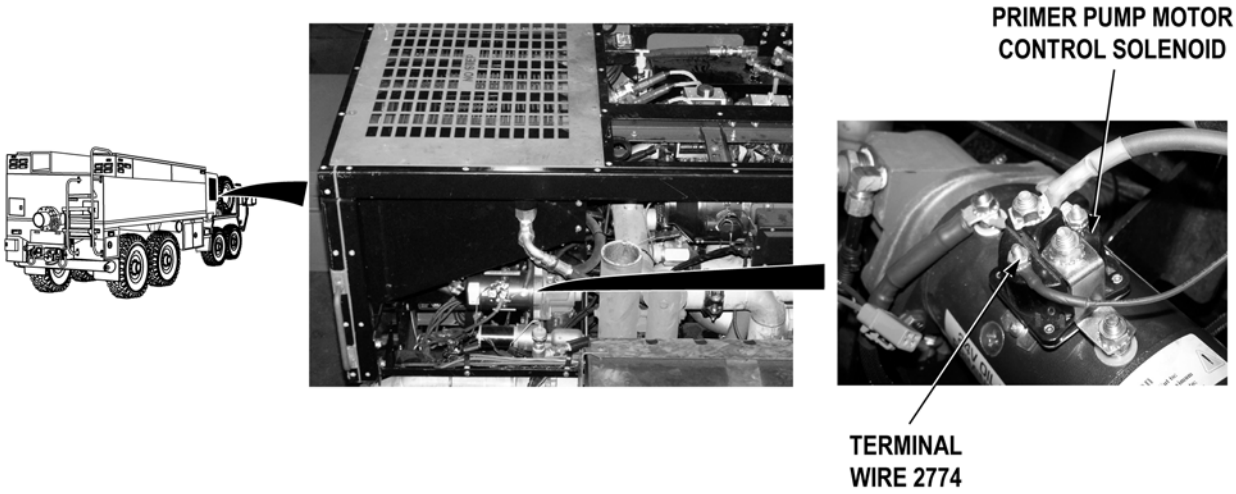
Step 11. Press pump operator's panel PUMP HOT PRESS TO TEST button (WP 0004). Check if PUMP HOT indicator illuminates (WP 0004).

If PUMP HOT indicator does not illuminate, go to Step 21.

Step 12. Open pump house access door assembly (WP 0009). Unwind 3 feet of hose from hose reel (WP 0024). Press REEL REWIND button (WP 0004), check if hose reel rewinds hose.

If hose reel does not rewind hose, go to Step 20.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



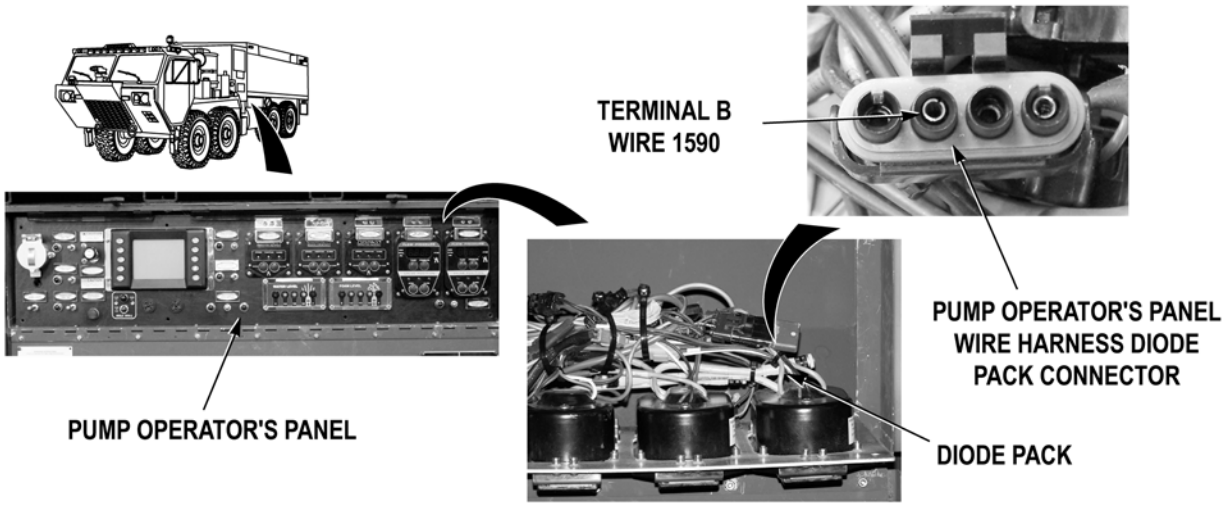
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 13. Remove pump house panel G (WP 0341). While an assistant pushes and holds pump operator's panel DRIVER MAIN INLET PRIMER button (WP 0004), check for 22 to 28 VDC between pump house wire harness wire 2774 (red) at primer pump motor control solenoid terminal and a known good ground.

If 22 to 28 VDC are present go to Step 22.

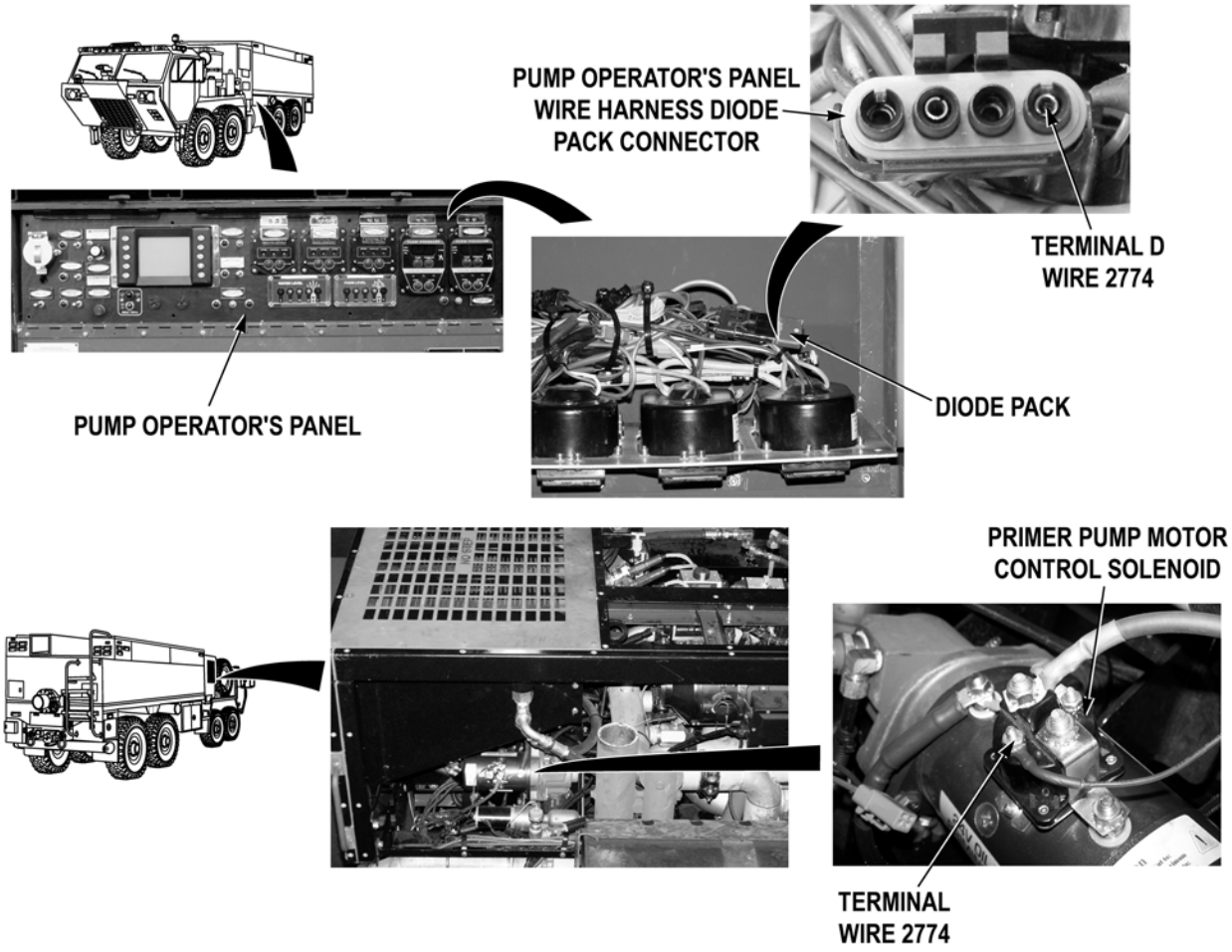
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Open pump operator’s panel (WP 0205). Remove diode pack from pump operator’s panel wire harness diode pack connector (WP 0220). While an assistant puts cab PUMP PRIME switch or pump operator’s panel DRIVER MAIN INLET PRIMER to on position (WP 0004), with a test lead set, check for 22 to 28 VDC between pump operator’s panel wire harness wire 1590 (red) at diode pack connector, terminal B and a known good ground.

If 22 to 28 VDC are not present, go to Step 18.

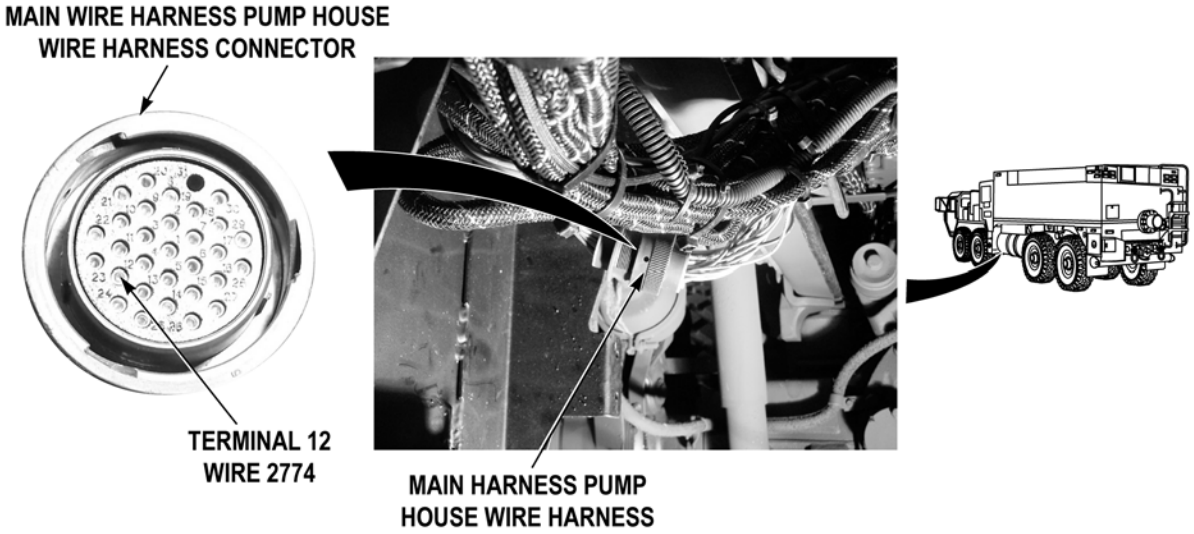
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2774 (red) from pump operator's panel wire harness diode pack connector, terminal D to pump house wire harness primer pump motor control solenoid terminal.

If there is continuity, replace diode pack (WP 0220).

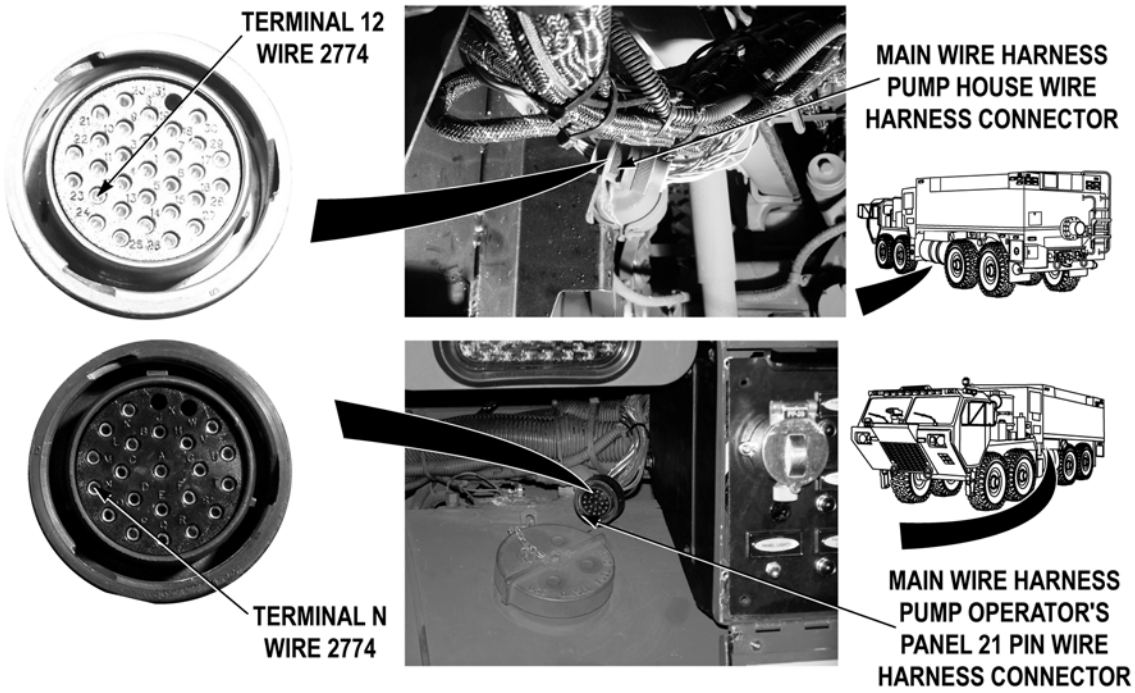
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Install diode pack on diode pack connector (WP 0220). Disconnect main wire harness pump house wire harness connector. Push battery disconnect switch to on position (WP 0007). While an assistant puts cab PUMP PRIME switch to on position, with a test lead set, check for 22 to 28 VDC between main wire harness wire 2774 (red) at main wire harness pump house wire harness connector, terminal 12 and a known good ground.

If 22 to 28 VDC are present, repair wire 2774 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

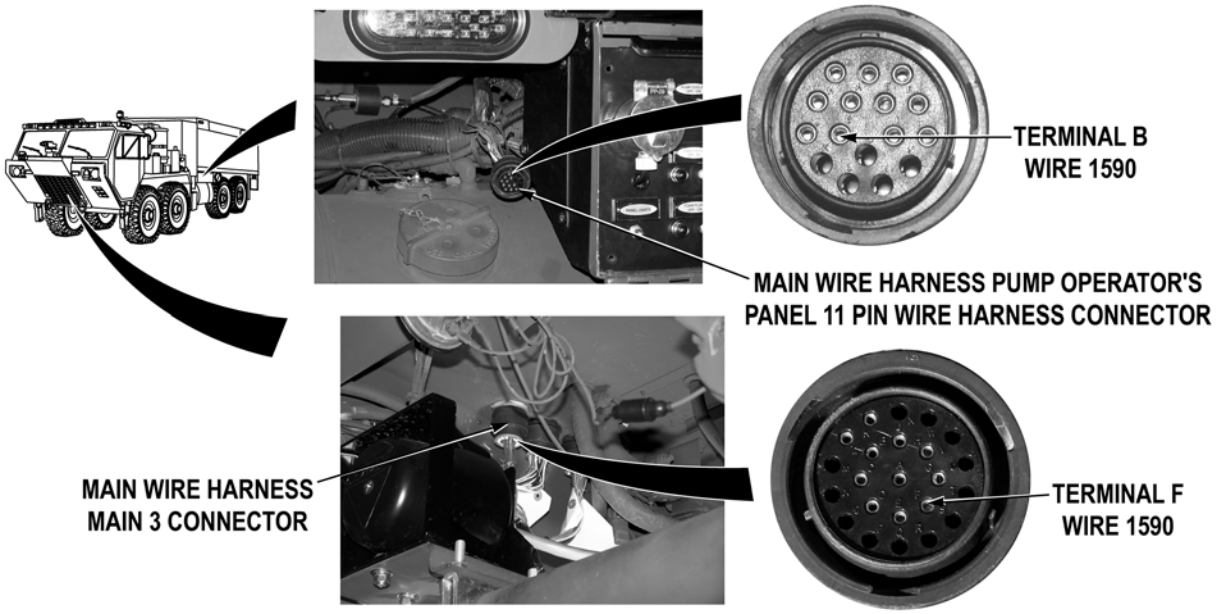


Step 17. Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across main wire harness wire 2774 (red) from main wire harness pump house wire harness connector, terminal 12, to main wire harness pump operator's panel 21 pin wire harness connector, terminal N.

a. If there is continuity, repair wire 2774 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 2774 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

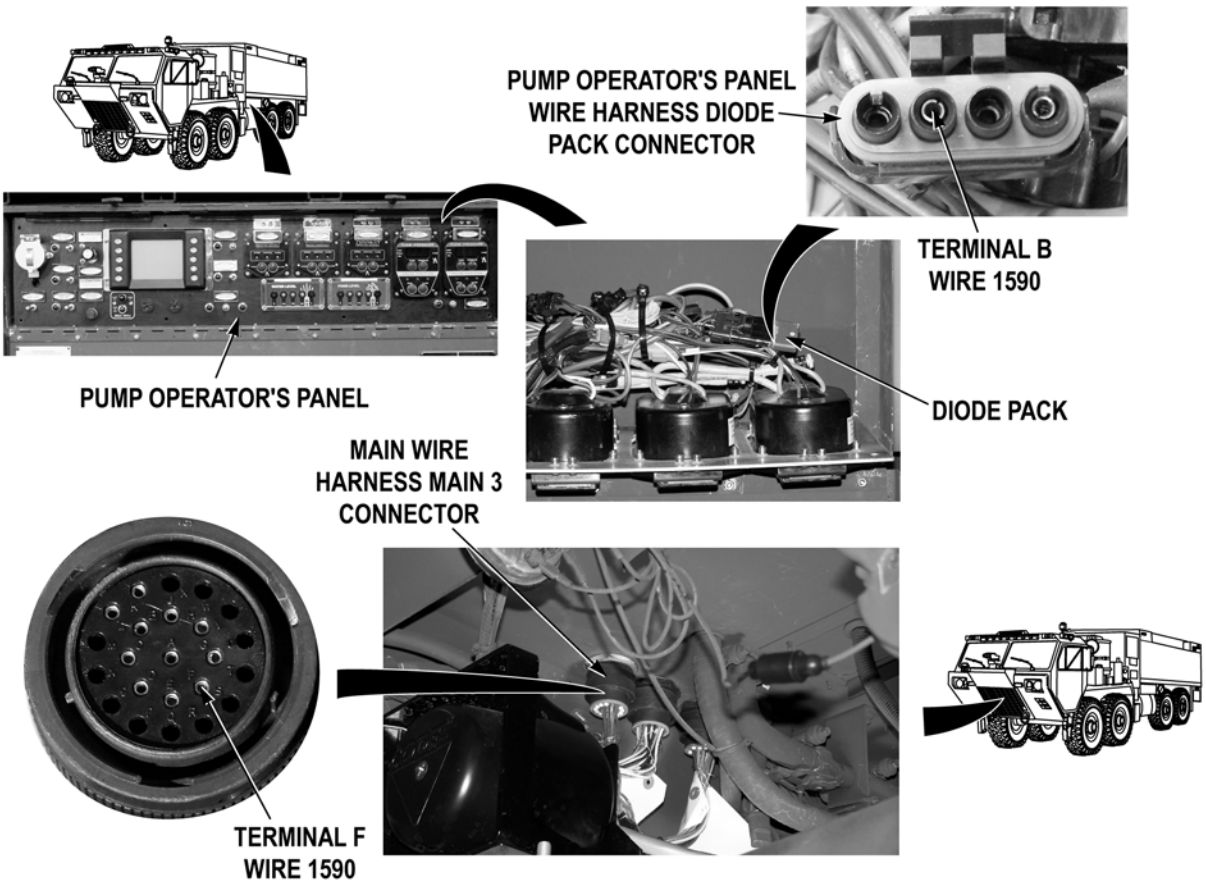
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Remove skid plate grille (WP 0350). Disconnect main wire harness pump operator's panel 11 pin wire harness connector. Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 1590 (red), from main wire harness main 3 connector, terminal F, to main wire harness pump operator's panel 11 pin wire harness connector, terminal B.

If there is no continuity, repair wire 1590 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

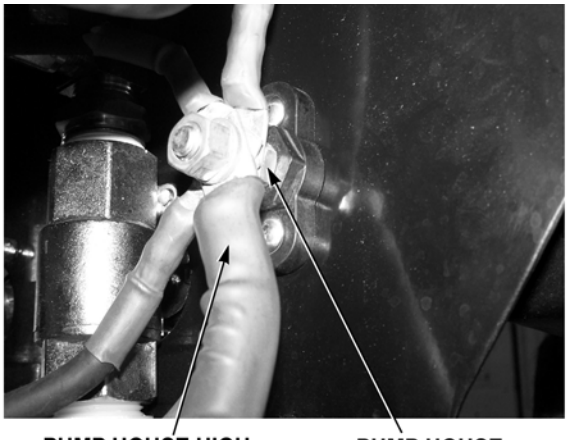


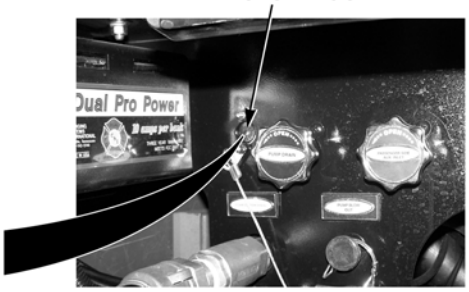
Step 19. Reconnect main wire harness pump operator's panel 11 pin wire harness connector. With a test lead set, check for continuity across pump operator's panel wire harness wire 1590 (red) from main wire harness main 3 connector, terminal F, to pump operator's panel wire harness diode pack connector, terminal B.

a. If there is continuity, repair wire 1590 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 1590 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

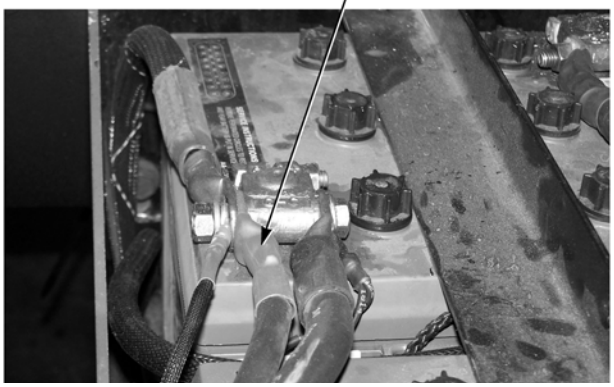




PUMP HOUSE HIGH AMPERAGE 2/0 CABLE

PUMP HOUSE B+ STUD

PUMP HOUSE HIGH AMPERAGE 2/0 CABLE



WARNING

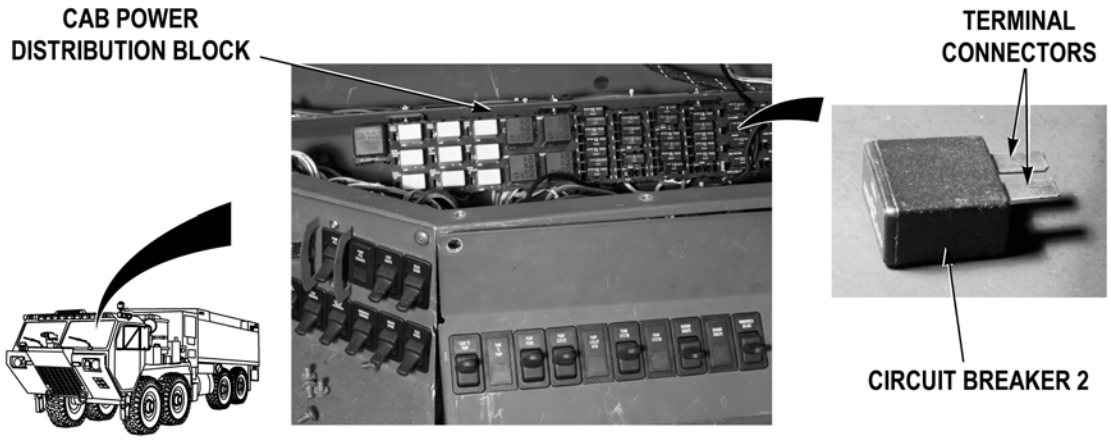
- **Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.**
- **Do not smoke, use open flame, make sparks or other ignition sources around batteries. A battery giving off gas could explode and cause injury to personnel.**

Step 20. Disconnect vehicle's negative battery terminals (TM 9-2320-315-14&P). Check for continuity across pump house high amperage 2/0 cable from pump house B+ stud to vehicle's positive battery post.

a. If there is continuity, replace pump house B+ stud (WP 0302).

b. If there is no continuity, replace high amperage 2/0 gauge cable between pump house B+ stud and vehicle's batteries (WP 0250).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

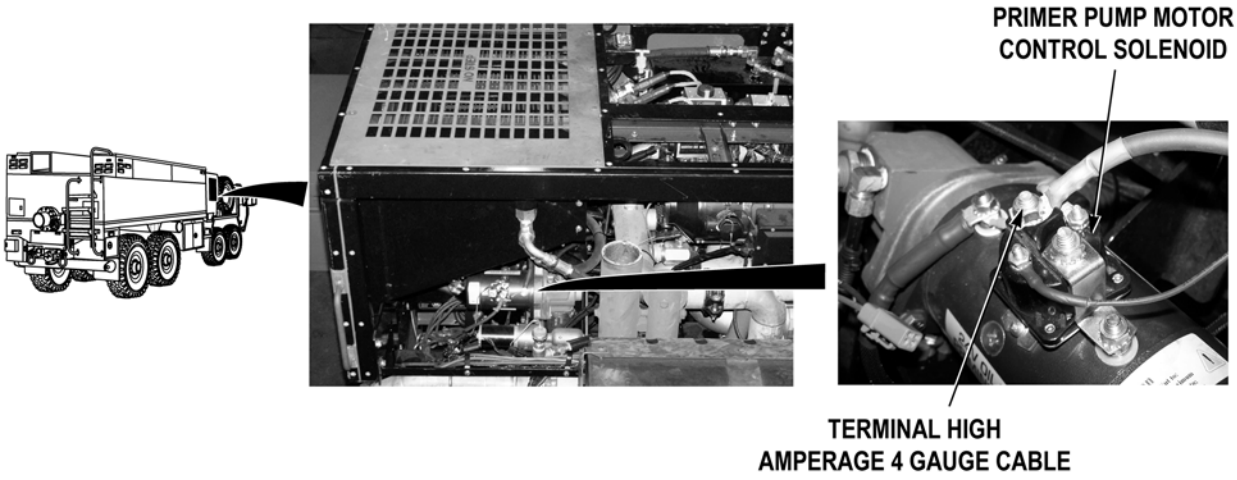


Step 21. Remove cab instrument panel A (WP 0205). Remove circuit breaker 2 from cab power distribution block (WP 0240). Check for continuity across circuit breaker.

a. If there is no continuity, replace circuit breaker 2 (WP 0240).

b. If there is continuity, replace cab power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



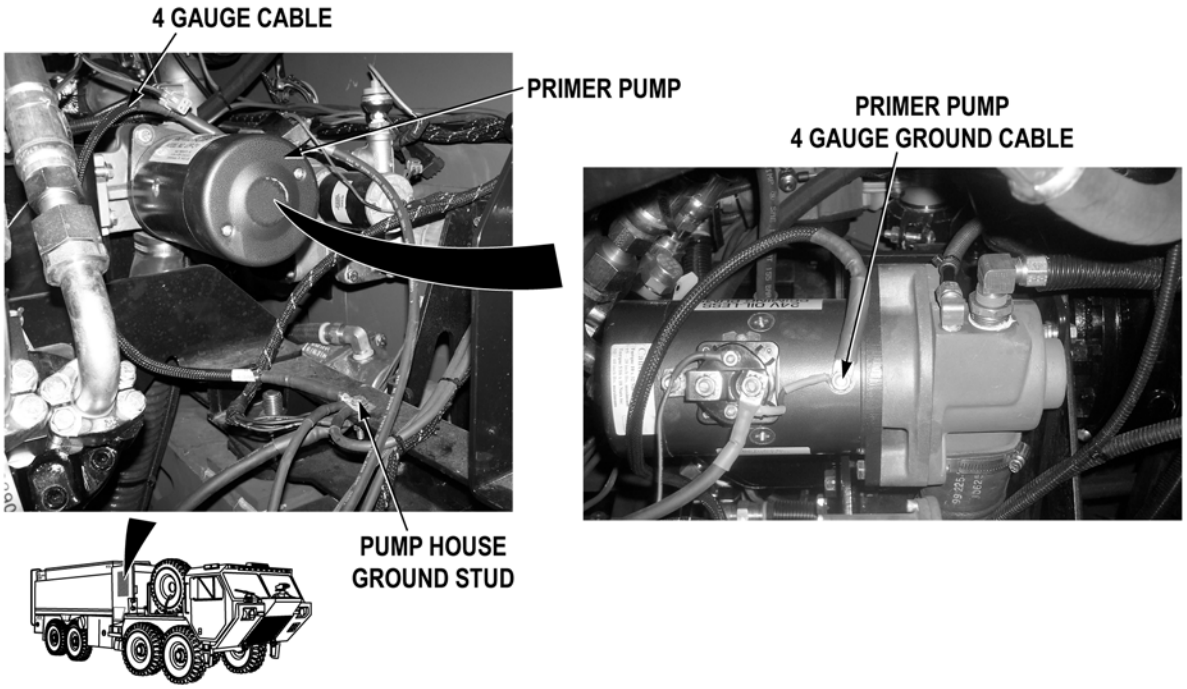
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 22. Check for 22 to 28 VDC between high amperage 4 gauge cable at primer pump motor solenoid terminal and a known good ground.

If 22 to 28 VDC are not present, replace high amperage 4 gauge cable between primer pump and pump house B+ stud (WP 0250).

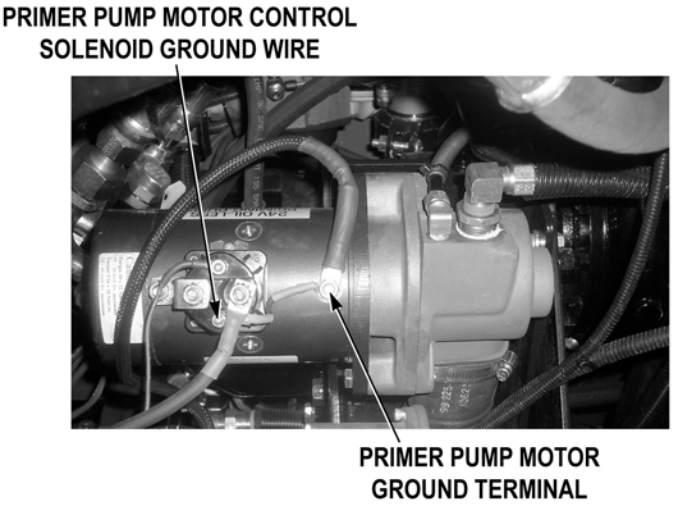
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 23. Remove pump house panel H (WP 0341). Pull battery disconnect switch to off position (WP 0007). Remove 4 gauge cable from primer pump motor ground terminal (WP 0163). Check for continuity across 4 gauge cable from primer pump motor 4 gauge ground cable termination to pump house ground stud.

If there is no continuity, replace 4 gauge cable (WP 0250).

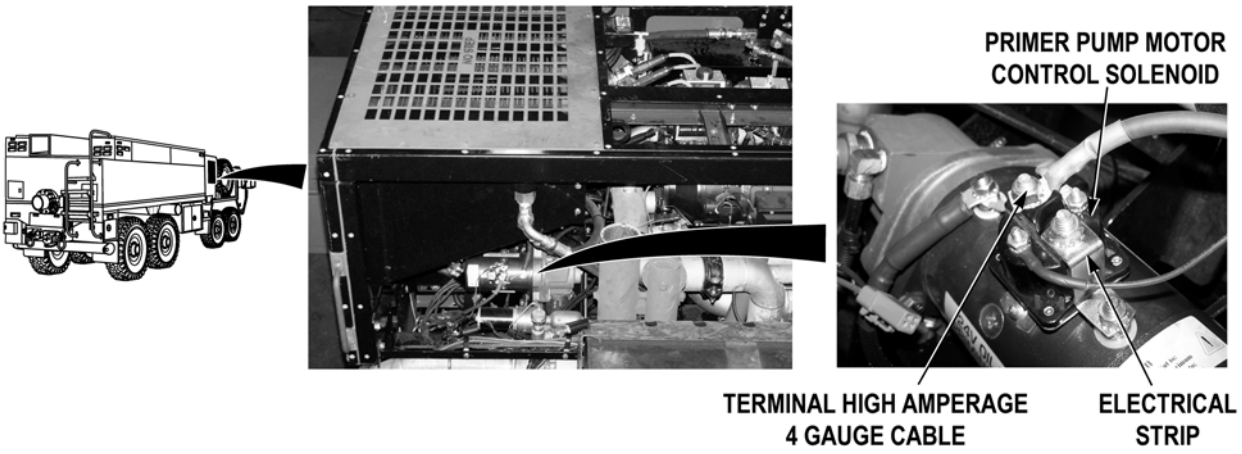
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 24. Install 4 gauge cable to primer pump motor ground terminal (WP 0163). Check for continuity across ground wire from primer pump motor ground terminal to primer pump motor control solenoid.

If there is no continuity, repair or replace jumperwire (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 25. Disconnect vehicle's negative battery terminals (TM 9-2320-315-14&P). Remove high amperage 4 gauge cable by disconnecting high amperage 4 gauge cable from primer pump motor control solenoid and pump house B+ terminal (WP 0250). Reconnect vehicle's negative battery terminals (TM 9-2320-315-14&P). Push battery disconnect switch to on position (WP 0007).While an assistant puts and holds cab PUMP PRIME switch to on position (WP 0004), check for continuity across primer pump control solenoid from high amperage 4 gauge cable terminal to primer pump electrical strip.

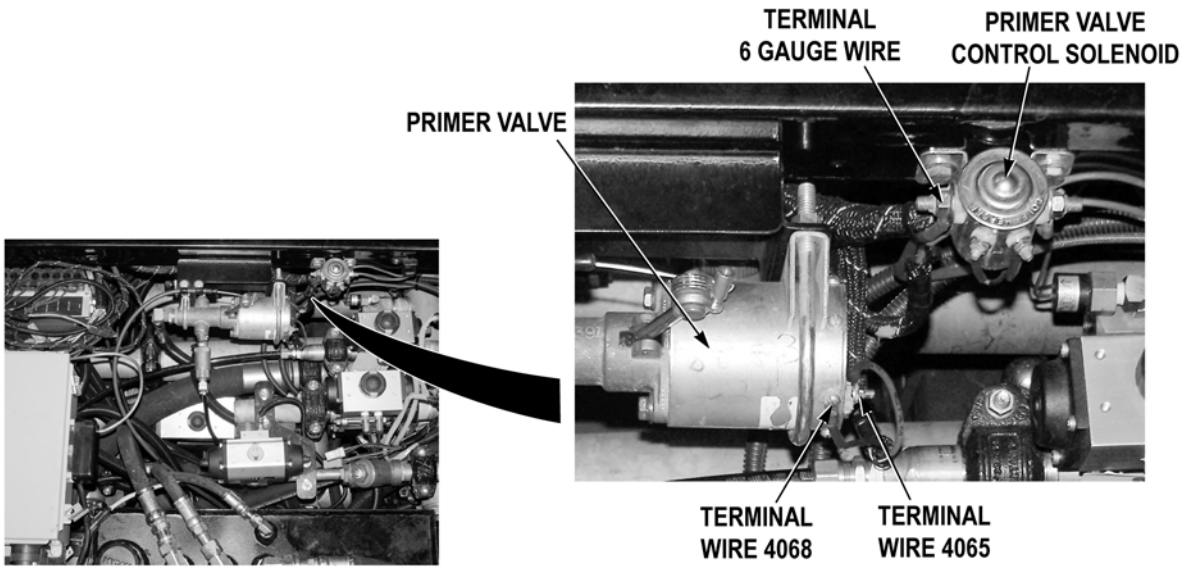
a. If there is continuity, replace primer pump (WP 0163).

b. If there is no continuity, replace primer pump control solenoid (WP 0301).

Step 26. Prepare vehicle to pump from draft (WP 0017). Pull manual priming cable to closed position (WP 0036). Check if water is drawn to water pump (WP 0017).

If water is not drawn to water pump, go to Step 36.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 27. Remove pump house panel K (WP 0341). While an assistant puts cab PUMP PRIME switch to on position (WP 0004), check if primer valve control solenoid is operating. Operation can be checked by listening for a metallic clicking sound and slight movement of solenoid.

If primer valve control solenoid does not click and slightly move, go to Step 33.

WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

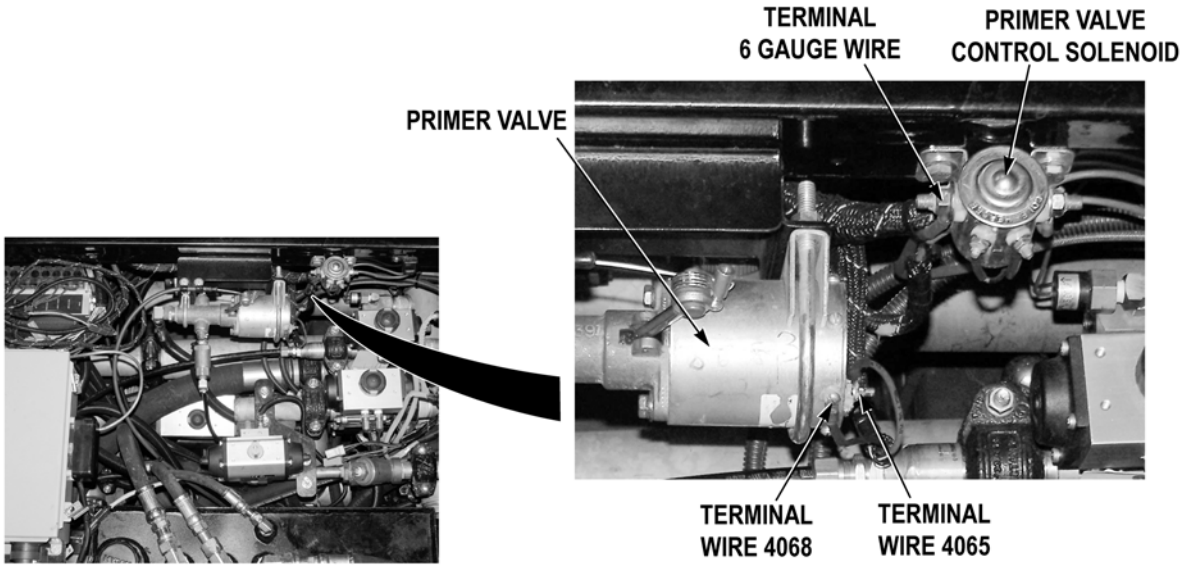
Step 28. Check for 22 to 28 VDC between 6 gauge wire at primer valve control solenoid terminal and a known good ground.

If 22 to 28 VDC are not present, replace 6 gauge wire from primer valve control solenoid to pump house B+ stud (WP 0250).

Step 29. While an assistant puts cab PUMP PRIME switch to on position (WP 0004), check for 22 to 28 VDC between pump house wire harness wire 4065 (red) at primer valve and a known good ground.

If 22 to 28 VDC are not present, go to Step 31.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

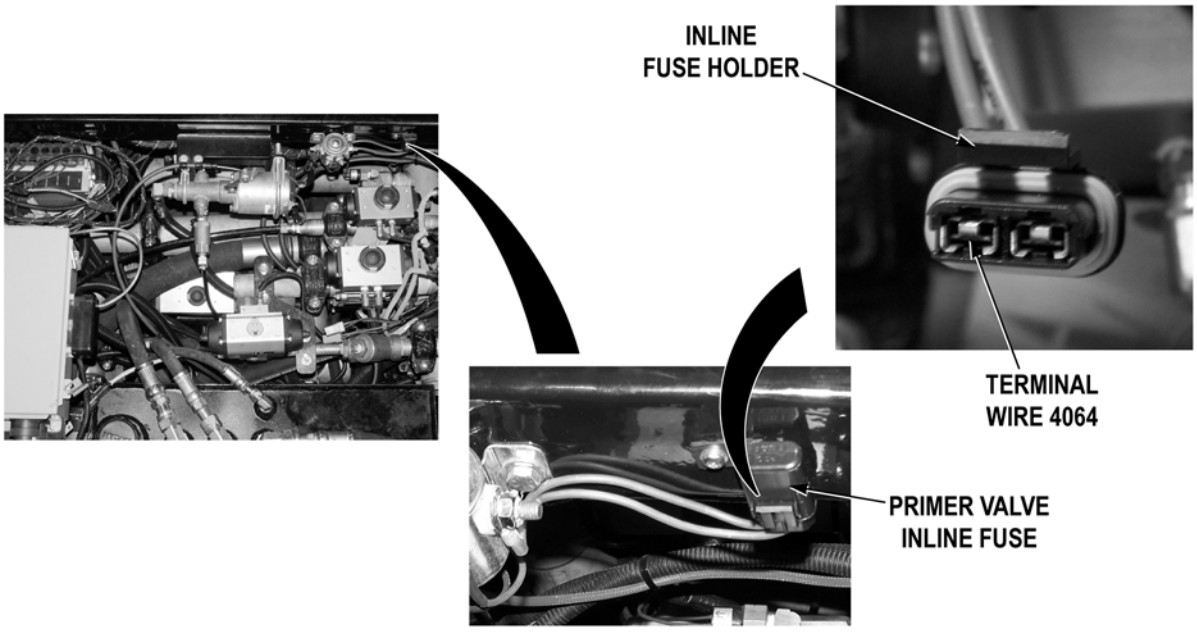


Step 30. Disconnect pump house wire harness wire 4068 (black) from primer valve terminal (WP 0167). Check for continuity across wire 4068 (black) from wire termination to a known good ground.

a. If there is continuity, replace primer valve (WP 0167).

b. If there is no continuity, repair wire 4068 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

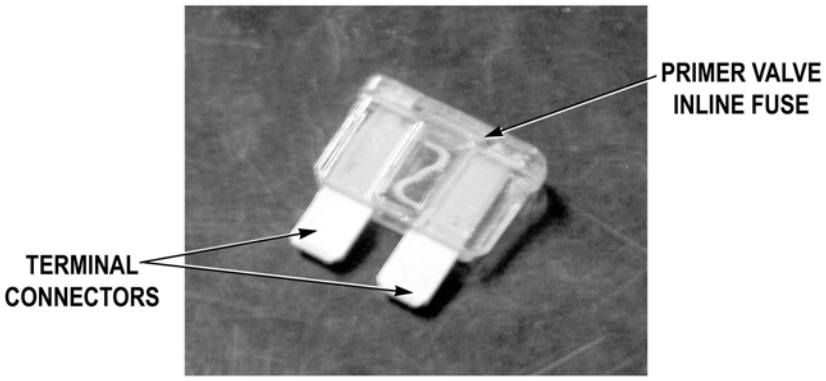
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 31. Remove primer valve inline fuse (WP 0254). While an assistant puts cab PUMP PRIME switch to on position (WP 0004), check for 22 to 28 VDC between pump house wire harness primer valve inline fuse holder terminal, wire 4064 (red) and a known good ground.

If 22 to 28 VDC are not present, replace primer pump valve control solenoid (WP 0166).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

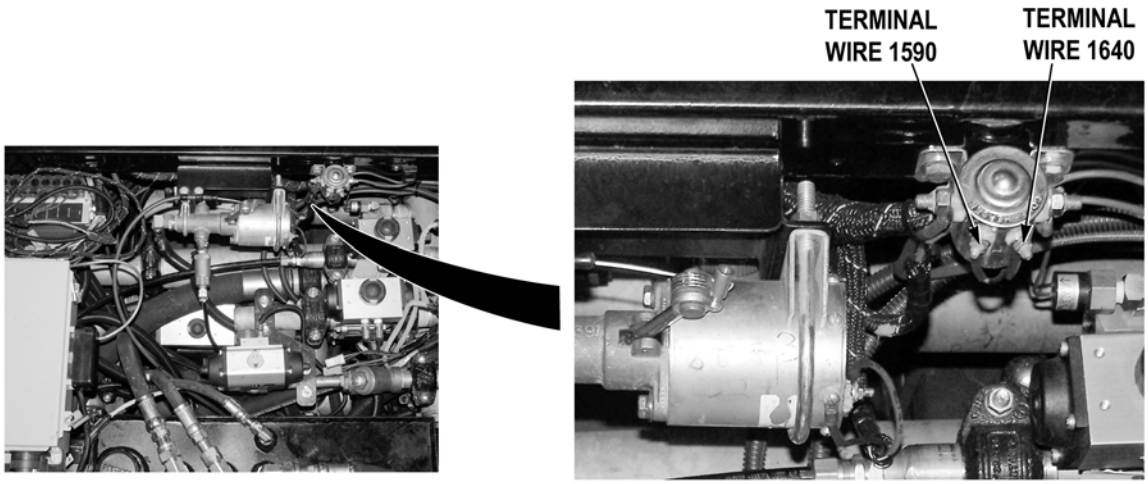


Step 32. Check for continuity across primer valve inline fuse from terminal to terminal (WP 0254).

a. If there is no continuity, replace fuse (WP 0254).

b. If there is continuity, repair wire 4065 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 33. While an assistant puts and holds cab PUMP PRIME switch to on position (WP 0004), check for 22 to 28 VDC between pump house wire harness wire 1590 (red) at primer valve control solenoid and a known good ground.

If 22 to 28 VDC are not present, go to Step 35.

Step 34. Pull battery disconnect switch to off position (WP 0007). Check for continuity across pump house wire harness wire 1640 (black) from primer valve control solenoid terminal to a known good ground.

a. If there is no continuity, repair wire 1640 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is continuity, replace primer valve control solenoid (WP 0166).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 35. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 1590 (red) at main wire harness pump house wire harness connector, terminal 30 and a known good ground.

a. If 22 to 28 VDC are present, repair wire 1590 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If 22 to 28 VDC are not present, repair wire 1590 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 36. Remove hard suction hose from driver main inlet (WP 0017). Inspect driver main inlet strainer screen and float for obstructions and blockage.

If screen and float are not free from blockage, remove blockage from driver main inlet strainer screen and float.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 37. Check if hard suction hose is free from holes, leaks, and damage.

If hard suction hose is not free from holes, leaks, and damage, replace hard suction hose.

Step 38. Connect hard suction hose to driver main inlet (WP 0017). Prepare vehicle to pump from draft (WP 0017). Check if primer pump is drawing water to water pump.

a. If hard suction hose coupler is fully seated and not drawing water into water pump, replace primer pump (WP 0163).

b. If hard suction hose coupler is not fully seated, use rubber mallet to tighten hard suction hose at driver main inlet (WP 0017).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

TANK FILL & RE-CIRCULATING LINE VALVE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0014
WP 0189
WP 0205

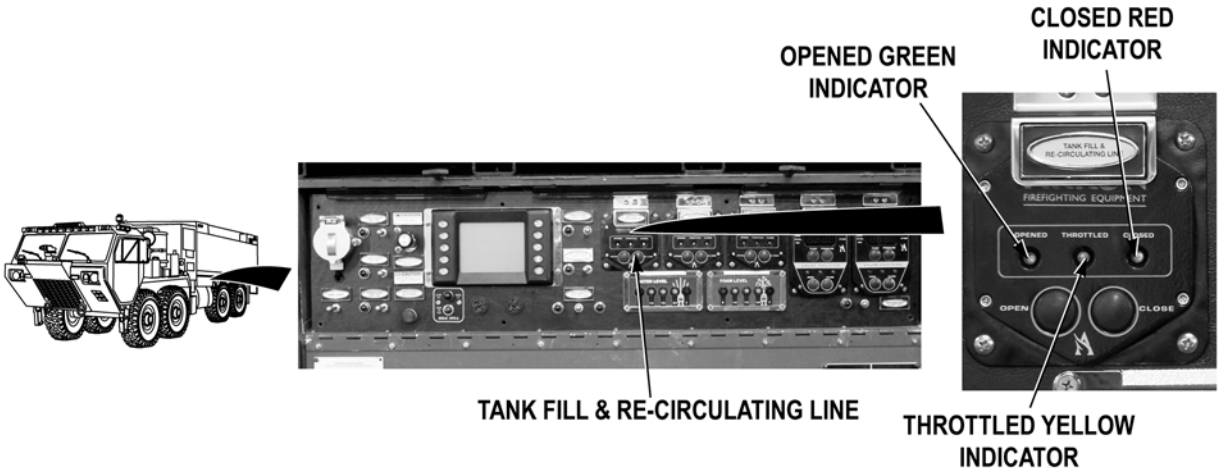
References (continued)
WP 0207
WP 0247
WP 0248
WP 0261
WP 0300
WP 0303
WP 0304
WP 0305
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TANK FILL & RE-CIRCULATING LINE VALVE DOES NOT OPERATE PROPERLY

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



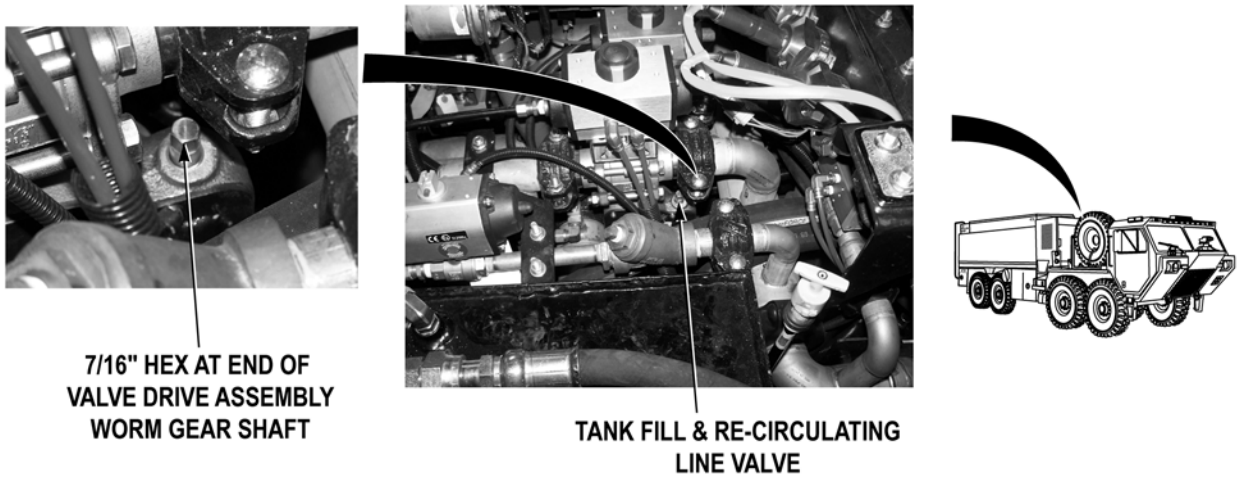
NOTE

Ensure batteries are fully charged before performing Step 1.

Step 1. Push battery disconnect switch to on position (WP 0007). Check if pump operator's panel TANK FILL & RE-CIRCULATING LINE valve control display illuminates.

If display is not illuminated, go to Step 11.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



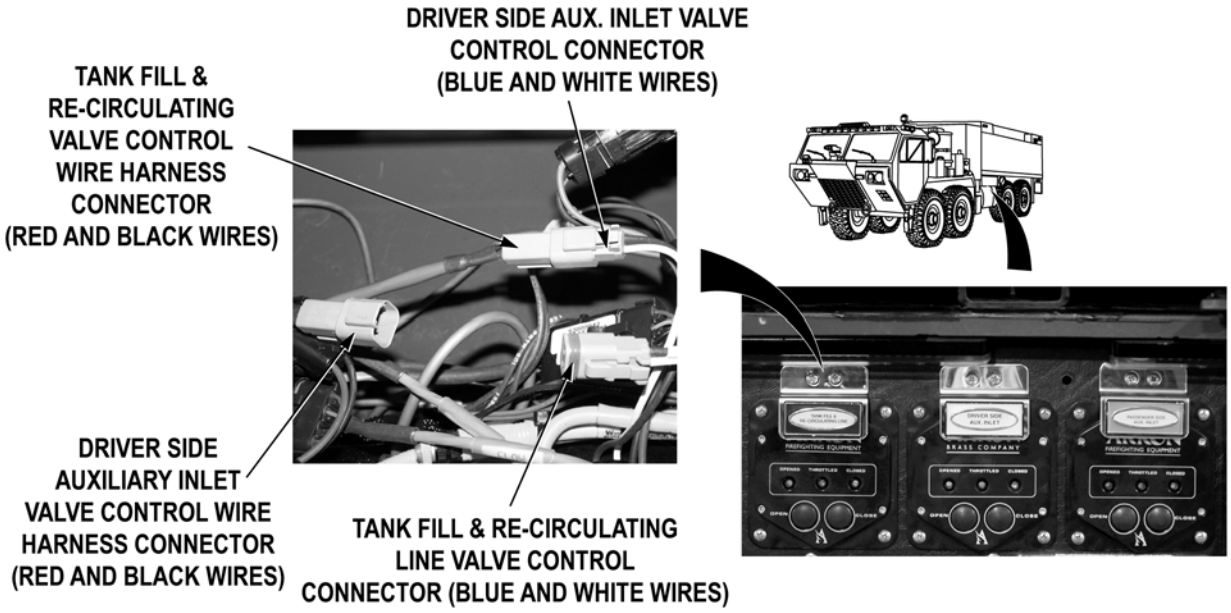
NOTE

Valve operation can be checked either by noting vibration of valve assembly, or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.

Step 2. Remove pump house panel K (WP 0341). While an assistant pushes pump operator’s panel TANK FILL & RE-CIRCULATING LINE valve control OPEN and CLOSE buttons (WP 0004), check if tank fill & re-circulating line valve operates.

If tank fill & re-circulating line valve does not open and close, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

NOTE

- Valve operations must be checked by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft for Step 3.
- TANK FILL & RE-CIRCULATING LINE valve control will indicate THROTTLED with a yellow indicator when valve is partially opened or closed.

Step 3. Pull battery disconnect switch to off position (WP 0007). Open pump operator’s panel (WP 0205). Disconnect valve control wire harness connector from TANK FILL & RE-CIRCULATING LINE valve control. Disconnect valve control wire harness connector from DRIVER SIDE AUX. INLET valve control. Connect TANK FILL & RE-CIRCULATING LINE valve control wire harness connector to DRIVER SIDE AUX. INLET valve control connector. Push battery disconnect switch to on position (WP 0007). While an assistant monitors operation of tank fill & re-circulating line valve. Push pump operator’s panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004). Check if DRIVER SIDE AUX. INLET valve control OPENED (green) and CLOSED (red) indicators illuminate before tank fill & re-circulating line valve is fully open and closed.

If DRIVER SIDE AUX. INLET valve control OPENED (green) and CLOSED (red) indicators do not illuminate before tank fill & re-circulating line valve is fully opened or closed, reconnect valve control wire harnesses to original positions and replace TANK FILL & RE-CIRCULATING LINE valve control (WP 0207).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NOTE

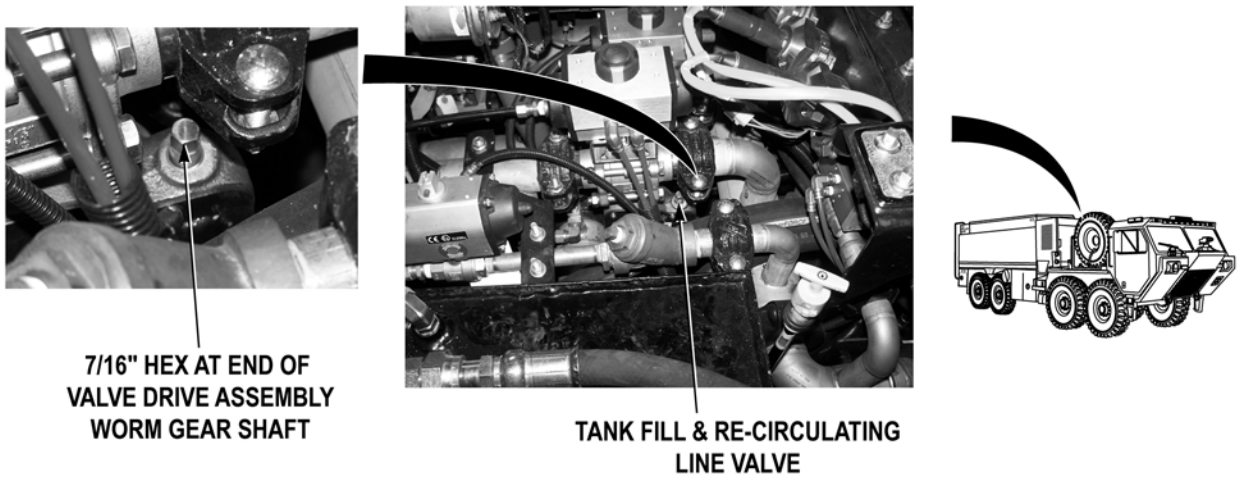
Water tank must be drained. Water will be released from water tank uncontrollably when tank fill & re-circulating valve is removed.

Step 4. Drain water tank if required (WP 0014). Pull battery disconnect switch to off position (WP 0007). Reconnect valve control wire harnesses to original positions. Remove tank fill & re-circulating line valve (WP 0189) and inspect it for binding, damage, and contamination.

a. If tank fill & re-circulating line valve is free from binding, damage and contamination, reinstall valve and replace tank fill & re-circulating line valve motor and drive assembly (WP 0247), and go to Step 7.

b. If tank fill & re-circulating line valve is binding, damaged, and/or contaminated, repair (WP 0248), or replace tank fill & re-circulating line valve (WP 0189).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. While an assistant pushes pump operator's panel TANK FILL & RE-CIRCULATING LINE valve control OPEN and CLOSE buttons (WP 0004), check if tank fill & re-circulating line valve worm gear shaft moves excessively after valve is fully opened or closed.

If tank fill & re-circulating line valve worm gear shaft moves excessively after valve is fully open or closed, remove and reinstall tank fill & re-circulating line valve motor (WP 0247), ensuring all mounting hardware is secure.

NOTE

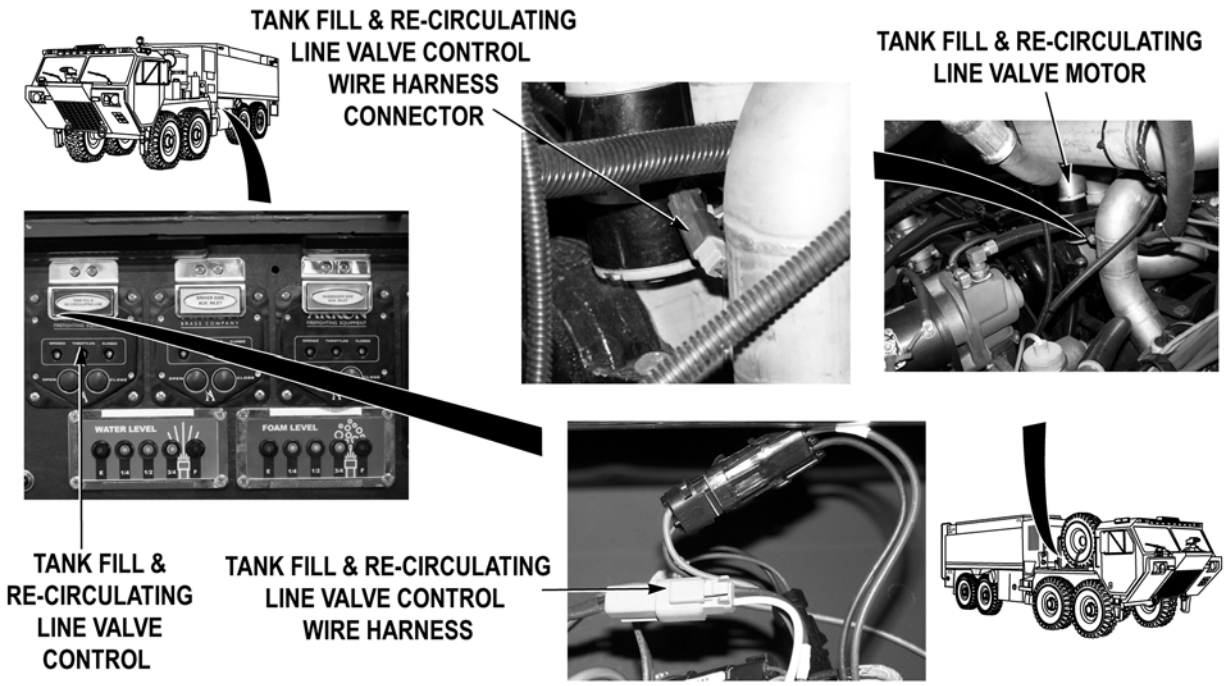
Water tank must be drained. Water will be released from water tank uncontrollably when tank fill & re-circulating line valve is removed.

Step 6. Drain water tank if required (WP 0014). Pull battery disconnect switch to off position (WP 0007). Remove tank fill & re-circulating line valve (WP 0189) and inspect it for binding, damage, and contamination.

a. If tank fill & re-circulating line valve is free from binding, damage, and contamination, reinstall valve (WP 0189), and go to Step 5.

b. If tank fill & re-circulating line valve is binding, damaged, and/or contaminated, repair (WP 0248) or replace tank fill & re-circulating line valve (WP 0189).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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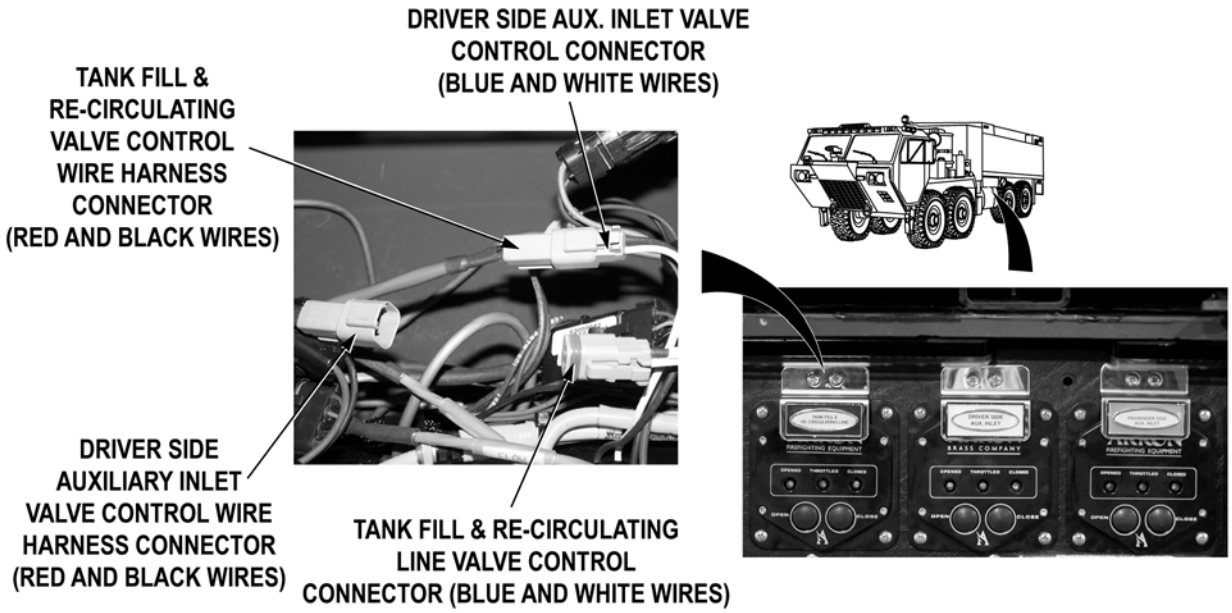
Step 7. Remove pump house panel G (WP 0341). Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Check tank fill & re-circulating valve control wire harness from TANK FILL & RE-CIRCULATING LINE valve control to tank fill & re-circulating line valve motor for loose connections.

If connections are loose, tighten loose connections (WP 0305).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



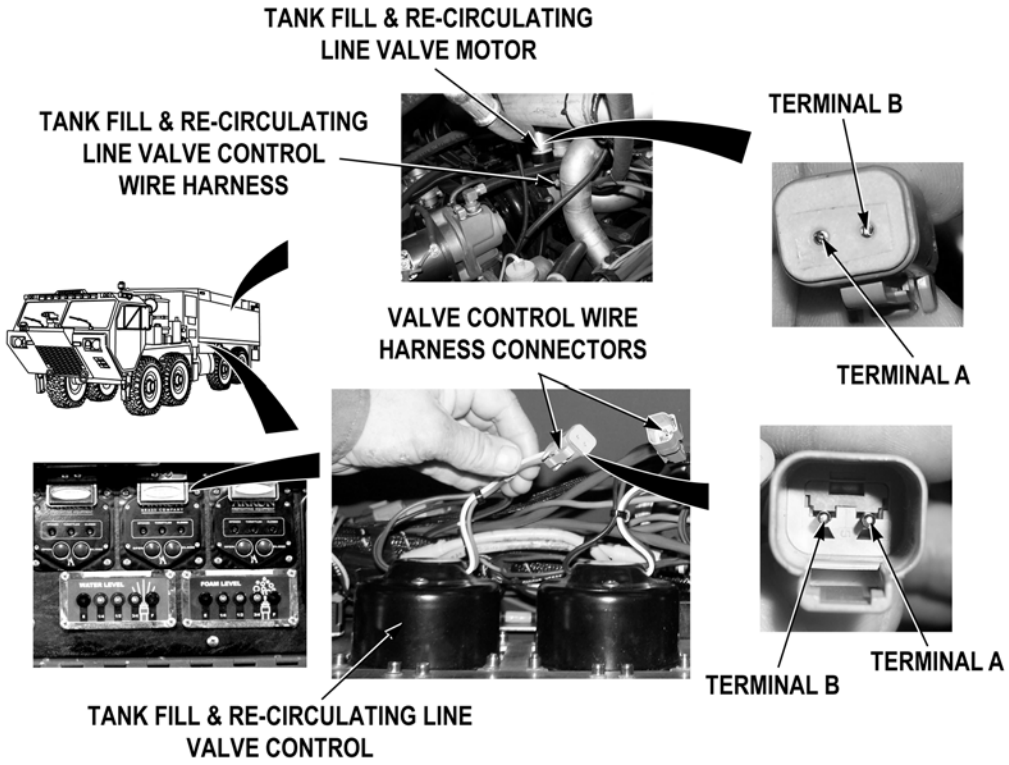
NOTE

- Do not engage PUMP PTO during this procedure. Valve operations can be checked without water pump operation.
- Valve motor operation can be checked either by noting vibration of valve assembly, or by observing rotation of 7/16” hex at end of valve drive assembly worm gear shaft.

Step 8. Push battery disconnect switch to on position (WP 0007). While an assistant pushes pump operator’s panel TANK FILL & RE-CIRCULATING LINE valve control OPEN and CLOSE buttons (WP 0004), check if TANK FILL & RE-CIRCULATING LINE valve control yellow THROTTLED indicator illuminates and tank fill & re-circulating line valve motor operates.

If indicator illuminates and valve motor operates, replace tank fill & re-circulating line valve drive assembly (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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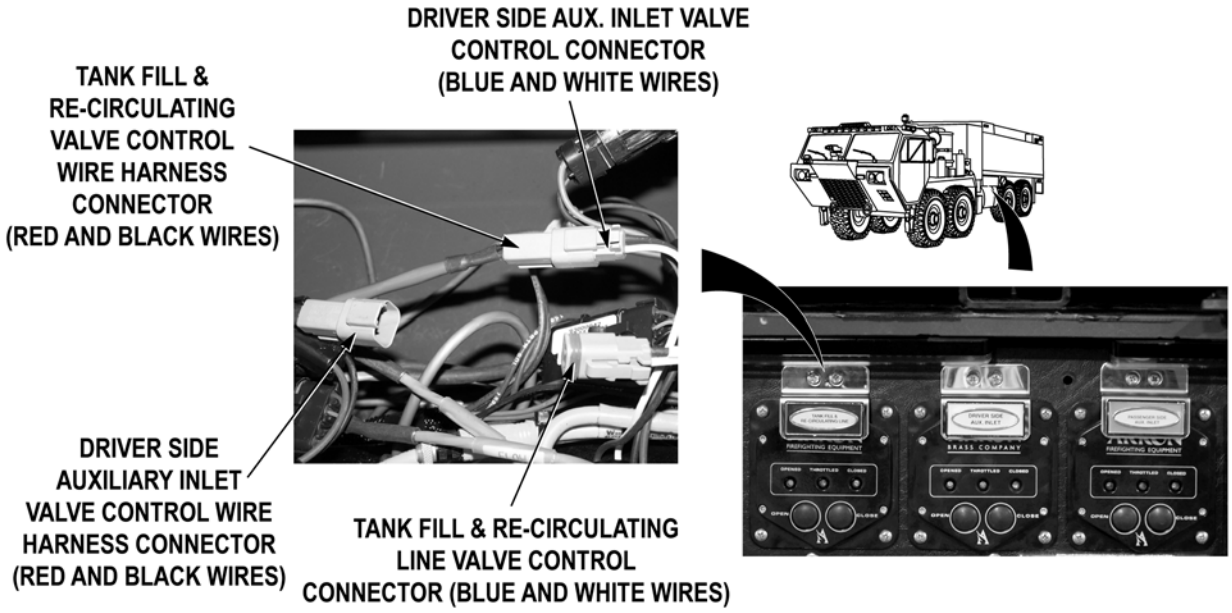
Step 9. Push battery disconnect to off position (WP 0007). Disconnect valve control wire harness connectors from TANK FILL & RE-CIRCULATING LINE valve control and tank fill & re-circulating line valve motor. With a test lead set, check for continuity between valve motor valve control wire harness and TANK FILL & RE-CIRCULATING LINE valve control connectors terminal to terminal.

If there is no continuity, repair wires (TM 9-2320-315-14&P), or replace tank fill & re-circulating line valve control wire harness (WP 0305).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

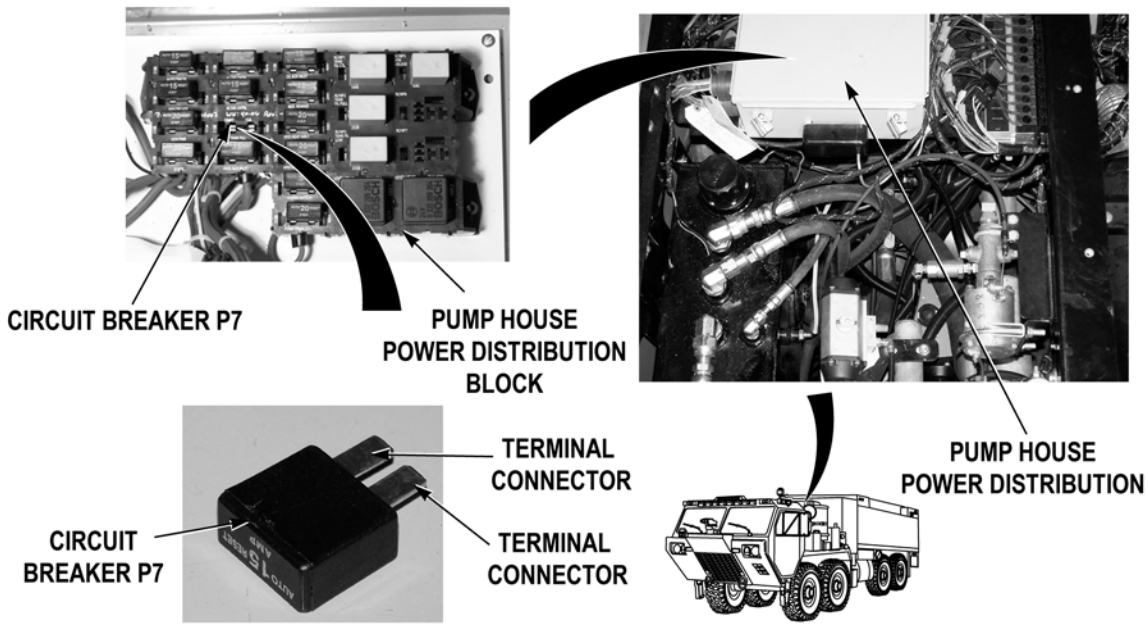


Step 10. Connect valve control wire harness connector to tank fill & re-circulating line valve motor. Disconnect valve control wire harness connectors from DRIVER SIDE AUX. INLET valve control. Connect tank fill & re-circulating line valve control wire harness connector to DRIVER SIDE AUX. INLET valve control. Push battery disconnect switch to on position (WP 0007). While an assistant pushes pump operator's panel DRIVER SIDE AUX. INLET valve control OPEN and CLOSE buttons (WP 0004), check if tank fill & re-circulating line valve operates.

a. If tank fill & re-circulating line valve operates, reconnect valve control wire harness connectors to original positions and replace TANK FILL & RE-CIRCULATING LINE valve control (WP 0207).

b. If tank fill & re-circulating line valve does not operate, reconnect valve control wire harness connectors to original positions and replace tank fill & re-circulating line valve motor (WP 0247).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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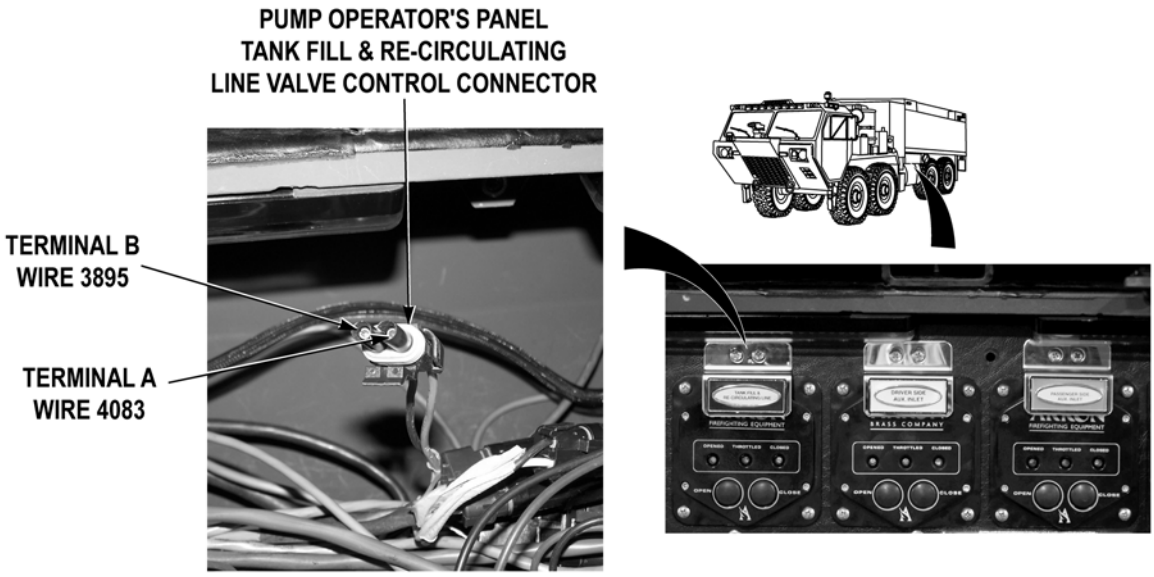
Step 11. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P7 from pump house power distribution block (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P7 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Install circuit breaker P7 (WP 0261). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness TANK FILL & RE-CIRCULATING LINE valve control connector. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump operator's panel wire harness wire 4083 (green) at TANK FILL & RE-CIRCULATING LINE valve control connector, terminal A and a known good ground.

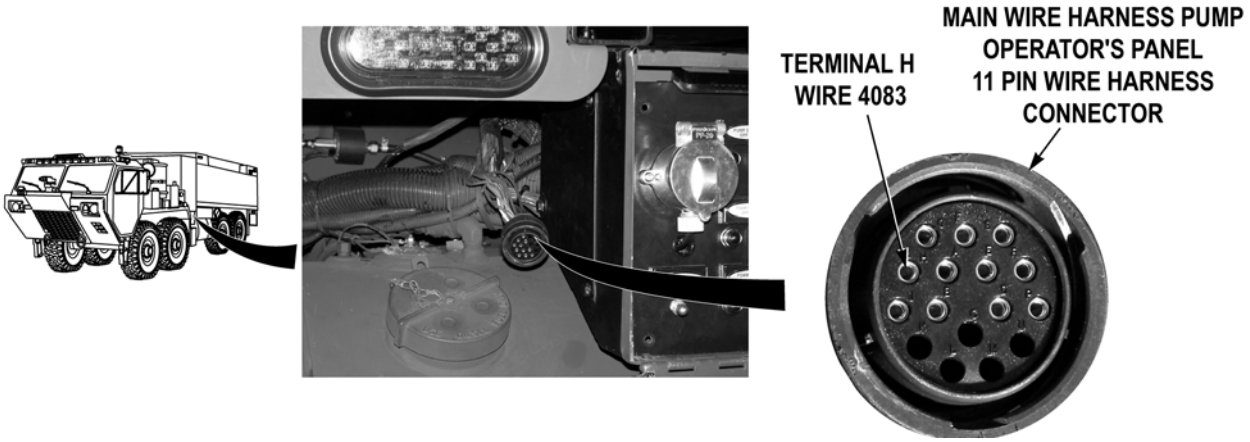
If 22 to 28 VDC are not present, go to Step 14.

Step 13. Pull battery disconnect switch to off position (WP 0007). Check for continuity across wire 3895 (black) from pump operator's panel TANK FILL & RE-CIRCULATING LINE valve control connector, terminal B and a known good ground.

a. If there is continuity, replace TANK FILL & RE-CIRCULATING LINE valve control (WP 0207).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

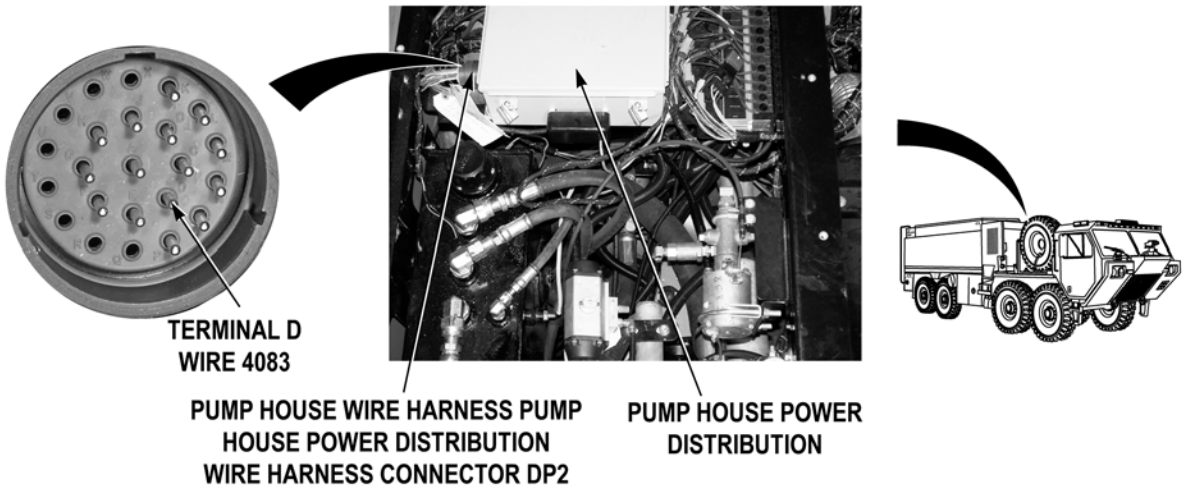
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Disconnect main wire harness pump operator’s panel 11 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 4083 (green) at main wire harness pump operator’s panel 11 pin wire harness connector, terminal H and a known good ground.

If 22 to 28 VDC are present, repair wire 4083 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for 22 to 28 VDC between pump house power distribution wire harness wire 4083 (green) at connector DP2, terminal D and a known good ground.

a. If 22 to 28 VDC are present, repair wire 4083 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If 22 to 28 VDC are not present, repair wire 4083 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

TANK-TO-PUMP VALVE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0014
WP 0185
WP 0197
WP 0203
WP 0205

References (continued)
WP 0219
WP 0240
WP 0242
WP 0246
WP 0270
WP 0280
WP 0281
WP 0293
WP 0304
WP 0322
WP 0324
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

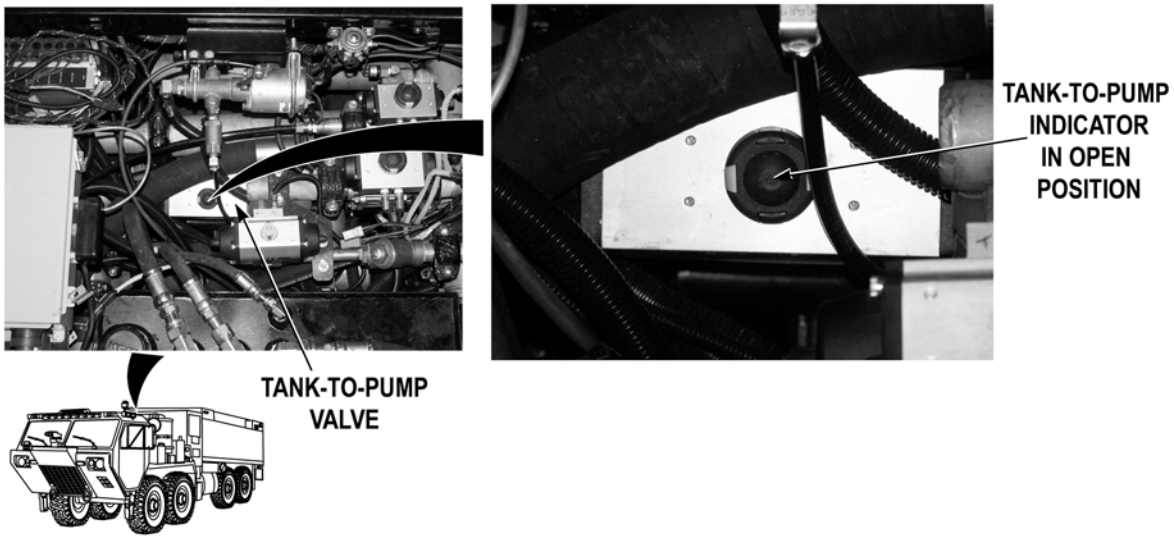
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TANK-TO-PUMP VALVE DOES NOT OPERATE PROPERLY

Step 1. Push battery disconnect switch to on position (WP 0007). Put UNDER TRUCK NOZZLES switch to on position (WP 0004). Check if UNDER TRUCK NOZZLES indicator illuminates.

If UNDER TRUCK NOZZLES indicator does not illuminate, go to Step 38.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 2. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Remove pump house panel K (WP 0341). While an assistant puts and holds pump operator's panel TANK TO PUMP switch to OPEN position (WP 0004), check if tank-to-pump valve operates to open position.

If tank-to-pump valve does not operate to open position, go to Step 27.

Step 3. Check if tank-to-pump valve remains in open position, after assistant releases pump operator's panel TANK TO PUMP switch (WP 0004).

If tank-to-pump valve does not remain in open position, go to Step 18.

Step 4. While an assistant puts pump operator's panel TANK TO PUMP switch to CLOSED position (WP 0004), check if tank-to-pump valve operates to closed position.

If tank-to-pump valve does not operate to closed position, go to Step 11.

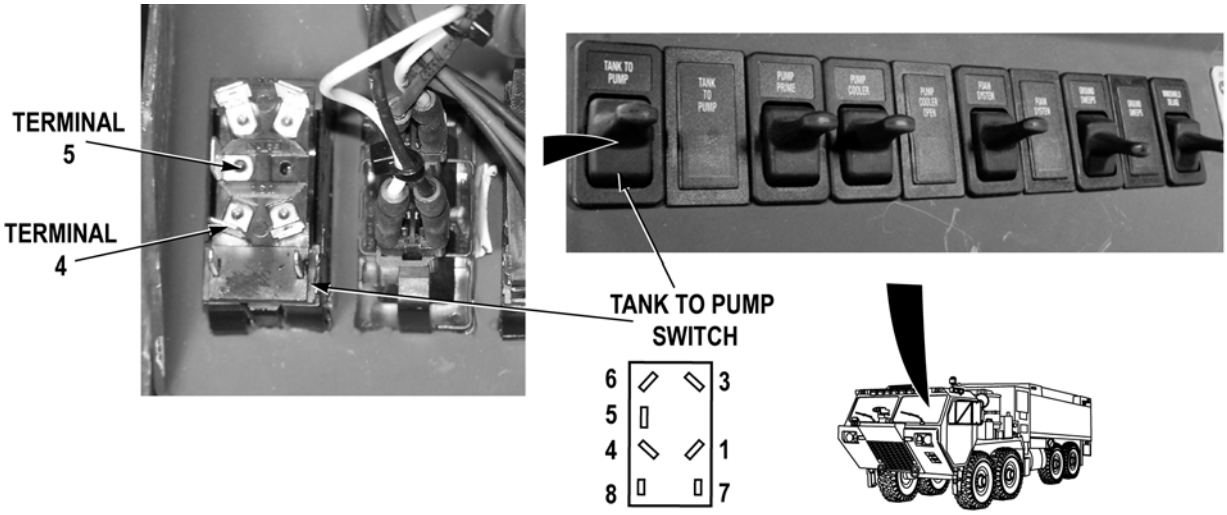
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 5. Release pump operator's panel TANK TO PUMP switch (WP 0004). While an assistant puts cab TANK TO PUMP switch to open position (WP 0004), check if tank-to-pump valve operates to open position.

If tank-to-pump valve does not operate to open position, go to Step 9.

Step 6. While an assistant puts cab TANK TO PUMP switch to closed position (WP 0004), check if tank-to-pump valve operates to closed position.

If tank-to-pump valve operates to closed position, go to Step 8.



WARNING

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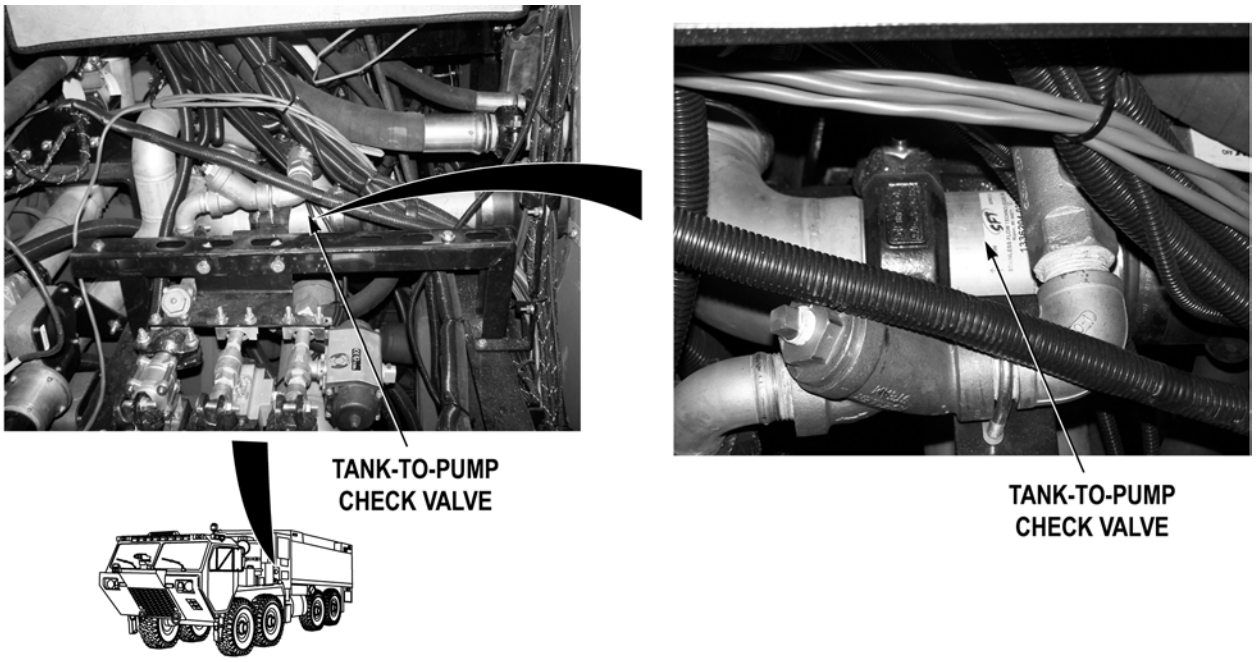
Step 7. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness PUMP TO TANK switch connector. Check for continuity across TANK TO PUMP switch, from terminal 5 to terminal 4, when switch is in closed position.

a. If there is continuity, repair wire 2770 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, replace cab TANK TO PUMP switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



⚠ CAUTION

Mark direction of flow on check valve prior to disassembly. Damage to water pump may occur if check valve is installed backwards, causing water pump to operate without water.

NOTE

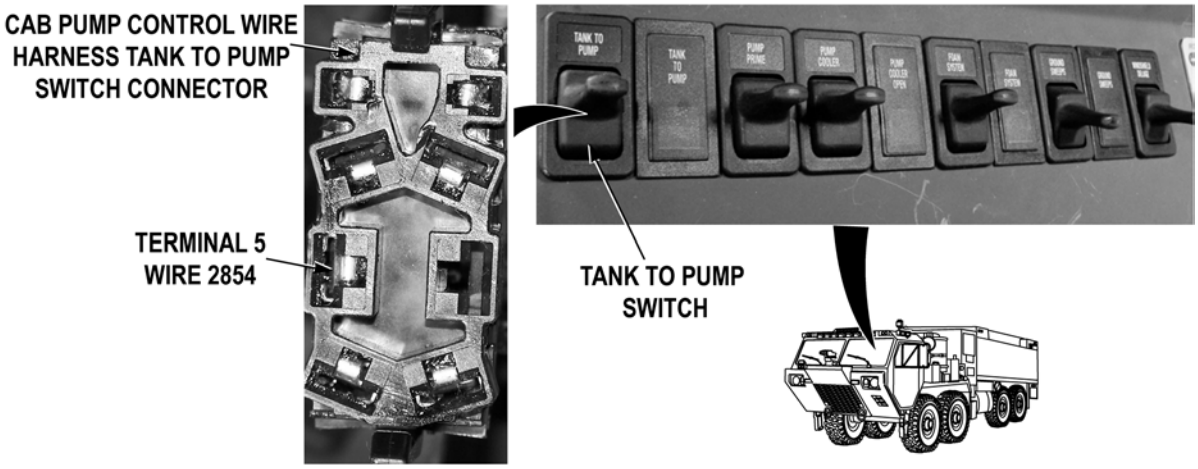
Water tank must be drained before removing tank-to-pump check valve. Water will be released from water tank uncontrollably when tank-to-pump check valve is removed.

Step 8. Remove pump house panel L (WP 0341). Remove hose reel (WP 0246). Drain water tank (WP 0014). Remove tank-to-pump check valve (WP 0185). Inspect check valve for damage, binding, or debris that could cause blockage.

a. If check valve is damaged or binding, replace check valve (WP 0185).

b. If check valve has debris that could cause blockage, clean debris and inspect hose leading from water tank for additional debris (WP 0322).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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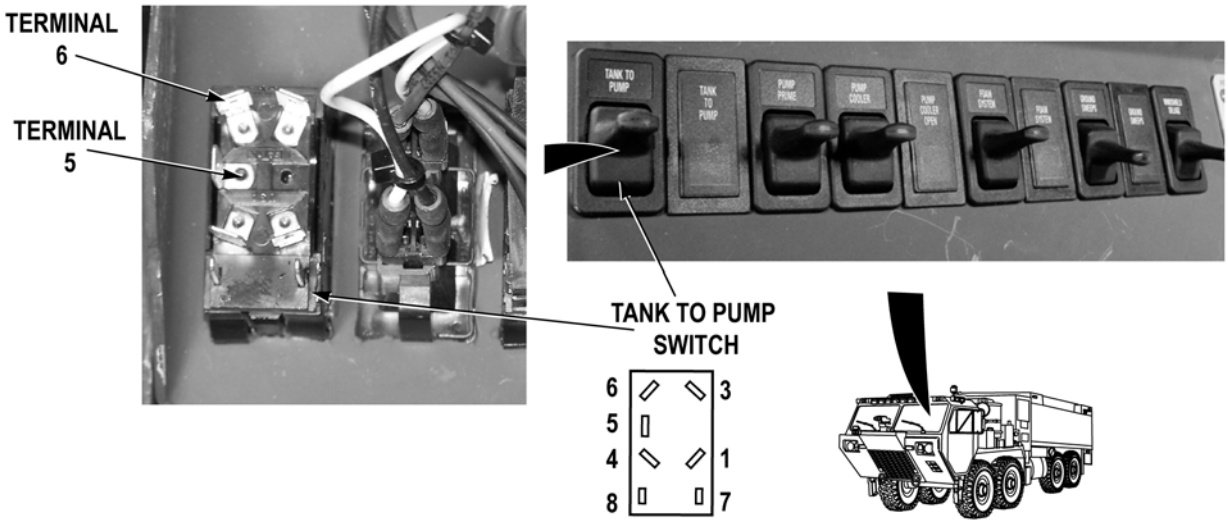
Step 9. Release TANK TO PUMP switch (WP 0004). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness TANK TO PUMP switch connector. Check for 22 to 28 VDC between cab pump control wire harness wire 2854 (red) at TANK TO PUMP switch connector, terminal 5 and a known good ground.

If 22 to 28 VDC are not present, repair wire 2854 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Pull battery disconnect switch to off position (WP 0007). While an assistant holds TANK TO PUMP switch in on position, check for continuity across TANK TO PUMP switch, from terminal 5 to terminal 6.

a. If there is continuity, repair wire 2855 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, replace cab TANK TO PUMP switch (WP 0197).

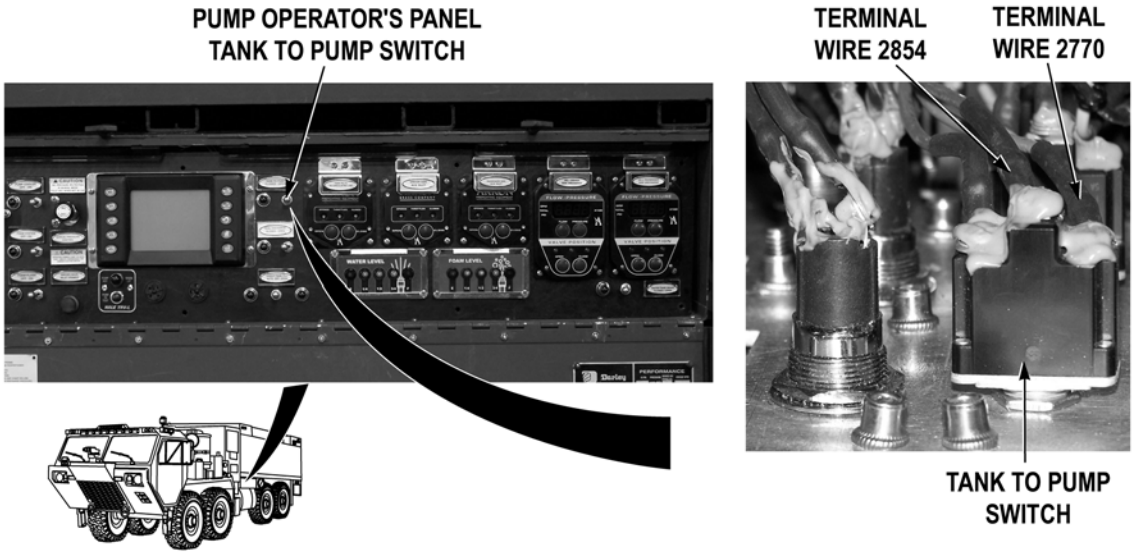
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 11. Release pump operator's panel TANK TO PUMP switch (WP 0004). While an assistant puts cab TANK TO PUMP switch to closed position (WP 0004), check if tank-to-pump valve operates to closed position.

If tank-to-pump valve does not operate to closed position, go to Step 15.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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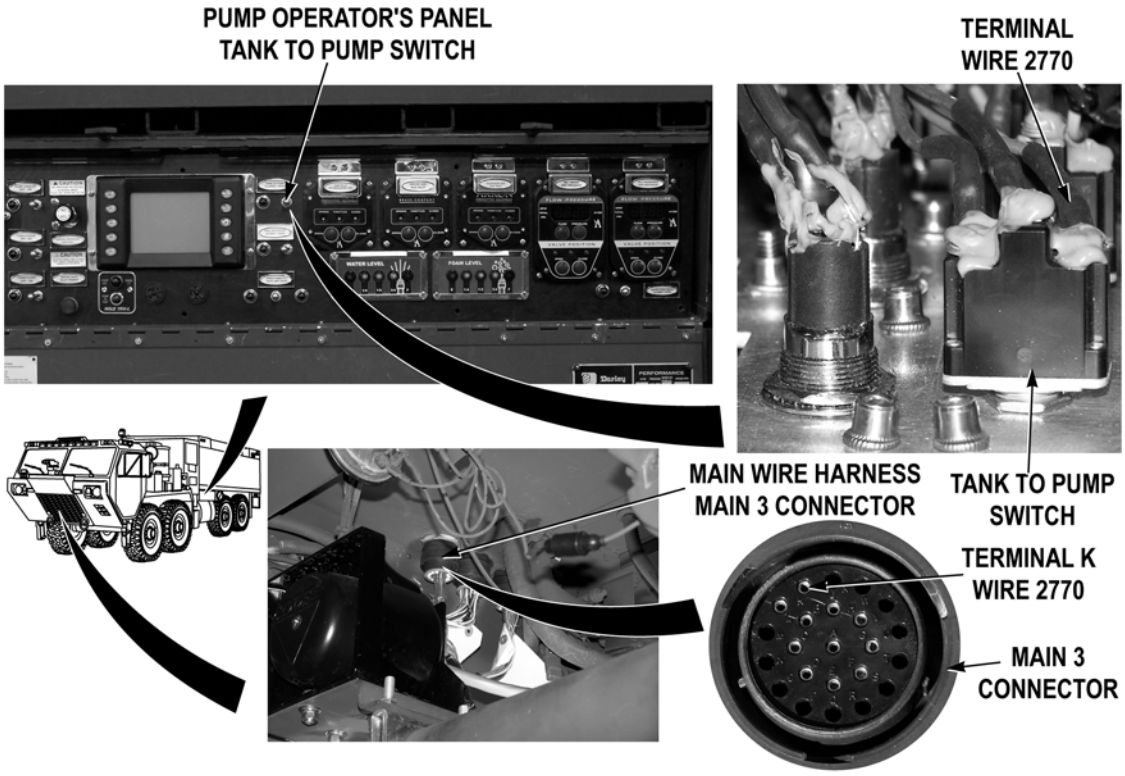
Step 12. Release TANK TO PUMP switch (WP 0004). Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel TANK TO PUMP switch, from terminal wire 2854 (red) to terminal wire 2770 (blue) when switch is in closed position.

If there is no continuity, replace pump operator's panel TANK TO PUMP switch (WP 0219).

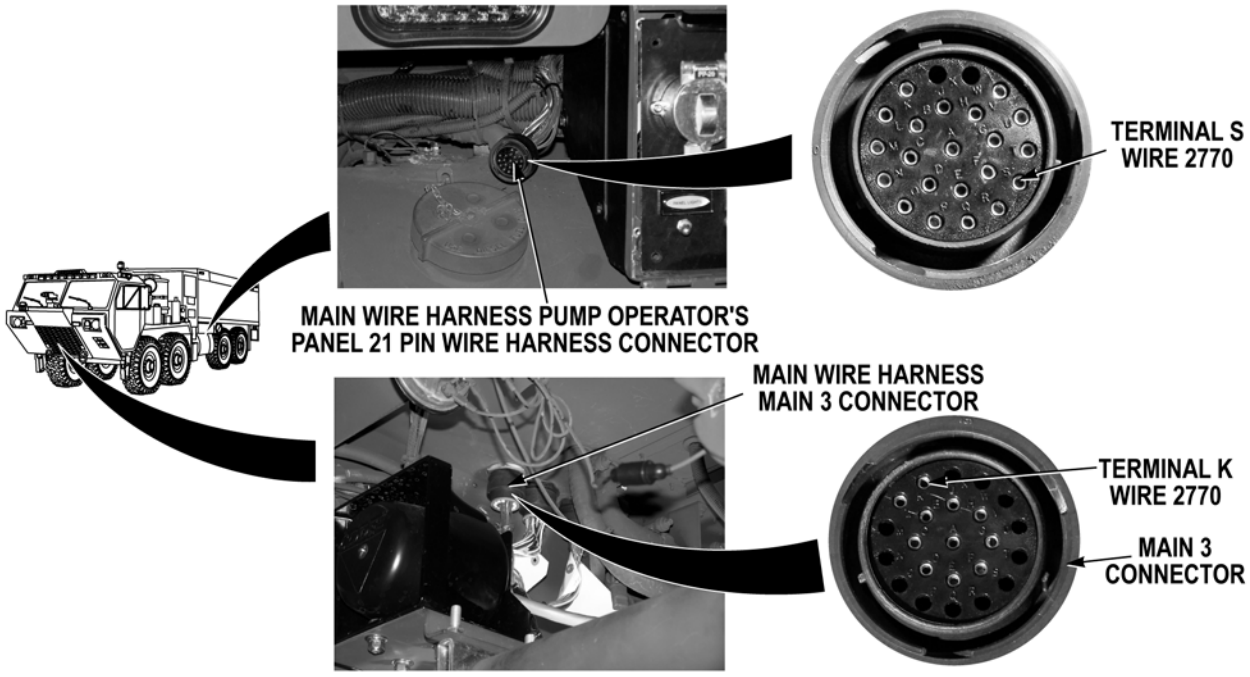
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set check for continuity across wire 2770 (blue) from pump operator's panel TANK TO PUMP switch terminal to main wire harness main 3 connector, terminal K.

If there is continuity, repair wire 2770 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

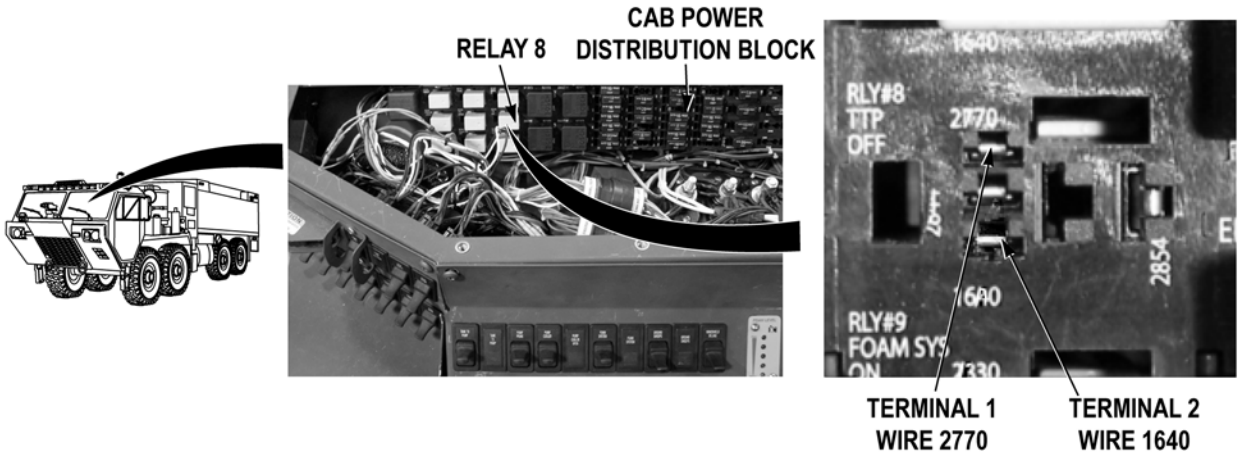


Step 14. Disconnect main wire harness pump operator’s panel 21 pin wire harness connector. With a test lead set check for continuity across main wire harness wire 2770 (blue) from main wire harness pump operator’s panel 21 pin wire harness connector, terminal S to main 3 connector, terminal K.

a. If there is continuity, repair wire 2770 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

b. If there is no continuity, repair wire 2770 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 15. Release TANK TO PUMP switch (WP 0004). Remove cab instrument panel A (WP 0203). Remove relay 8 (WP 0242). While an assistant puts cab TANK TO PUMP switch to close position (WP 0004), check for 22 to 28 VDC between cab power distribution wire harness wire 2770 (blue) at relay 8 connector, terminal 1 and a known good ground.

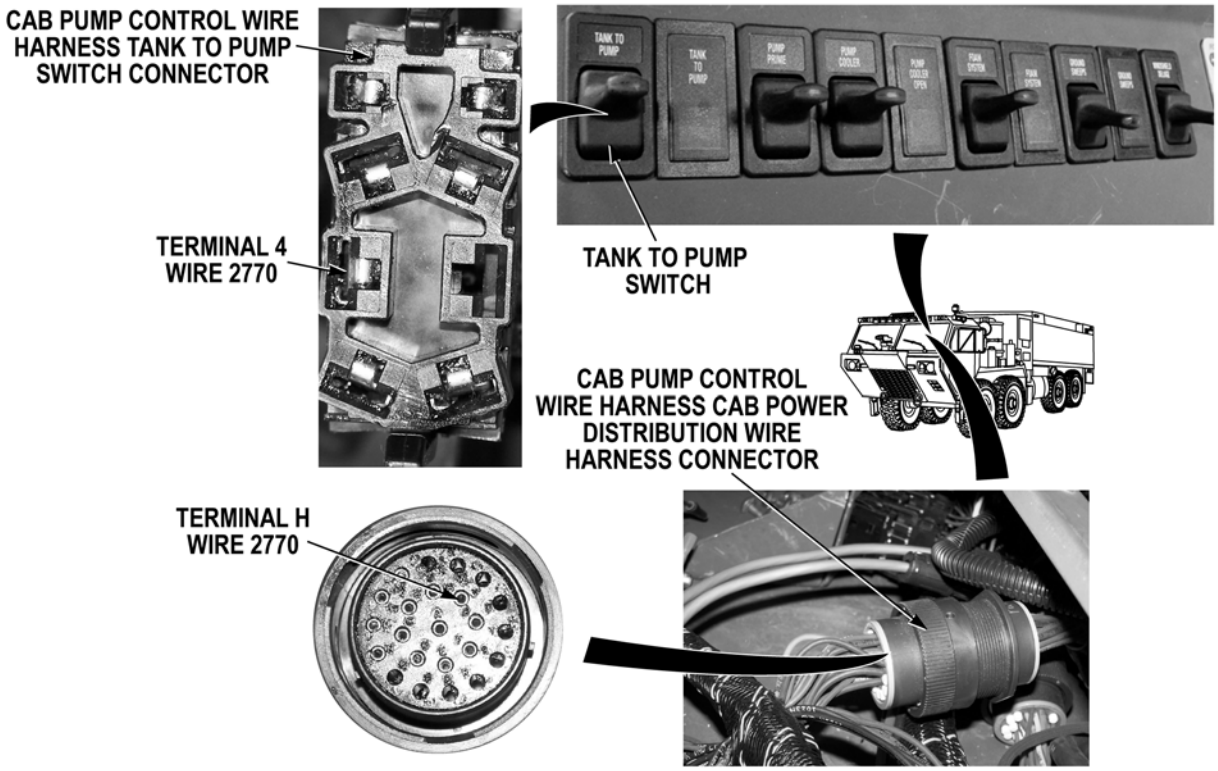
If 22 to 28 VDC are not present, go to Step 17.

Step 16. Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab power distribution wire harness wire 1640 (black) from relay 8 connector, terminal 2 to a known good ground.

a. If there is continuity, replace relay 8 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Pull battery disconnect switch to off position (WP 0007). Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 2770 (blue) from cab pump control wire harness TANK TO PUMP switch connector, terminal 4 to cab pump control wire harness connector, terminal H.

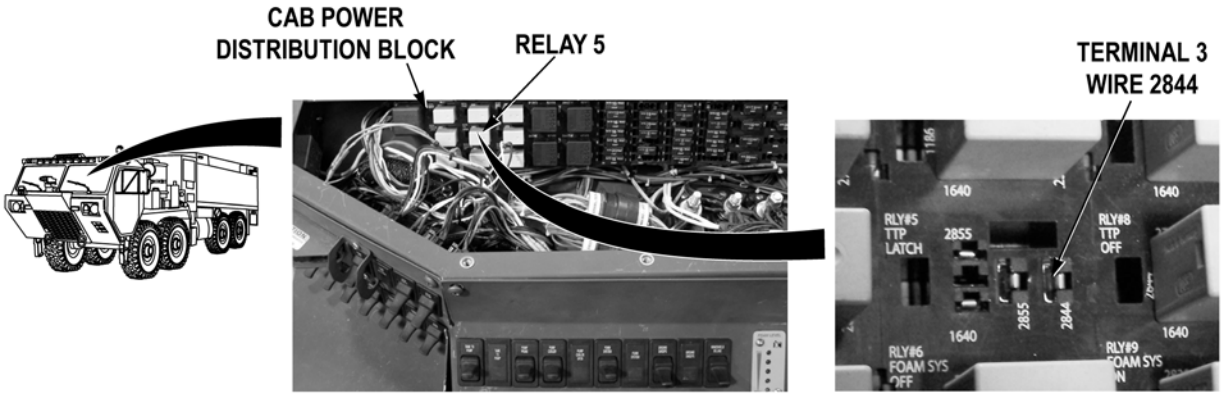
a. If there is continuity, repair wire 2770 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2770 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

Step 18. While an assistant puts cab TANK TO PUMP switch to open position (WP 0004), check if tank-to-pump valve operates to open position.

If tank-to-pump valve does not operate to open position, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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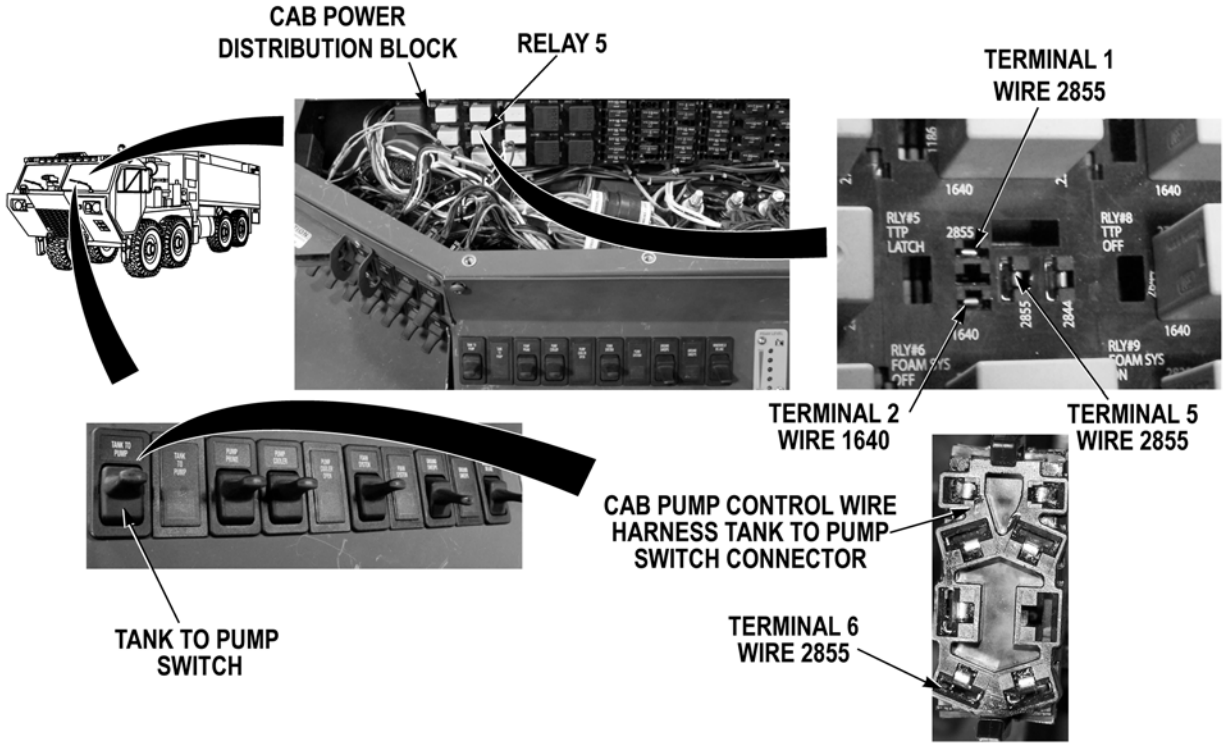
Step 19. Put cab TANK TO PUMP switch to closed position (WP 0004). Remove cab instrument panel A (WP 0203). Remove relay 5 (WP 0242). Check for 22 to 28 VDC between cab power distribution wire harness wire 2844 (white) at relay 5 connector, terminal 3 and a known good ground.

If 22 to 28 VDC are not present, go to Step 24.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 20. Pull battery disconnect switch to off position (WP 0007). Check for continuity across wire 2855 (red) from cab pump control wire harness TANK TO PUMP switch connector, terminal 6 to cab power distribution wire harness relay 5 connector, terminal 1.

If there is no continuity, go to Step 23.

Step 21. Check for continuity across cab power distribution wire harness wire 1640 (black) from relay 5 connector, terminal 2 to a known good ground.

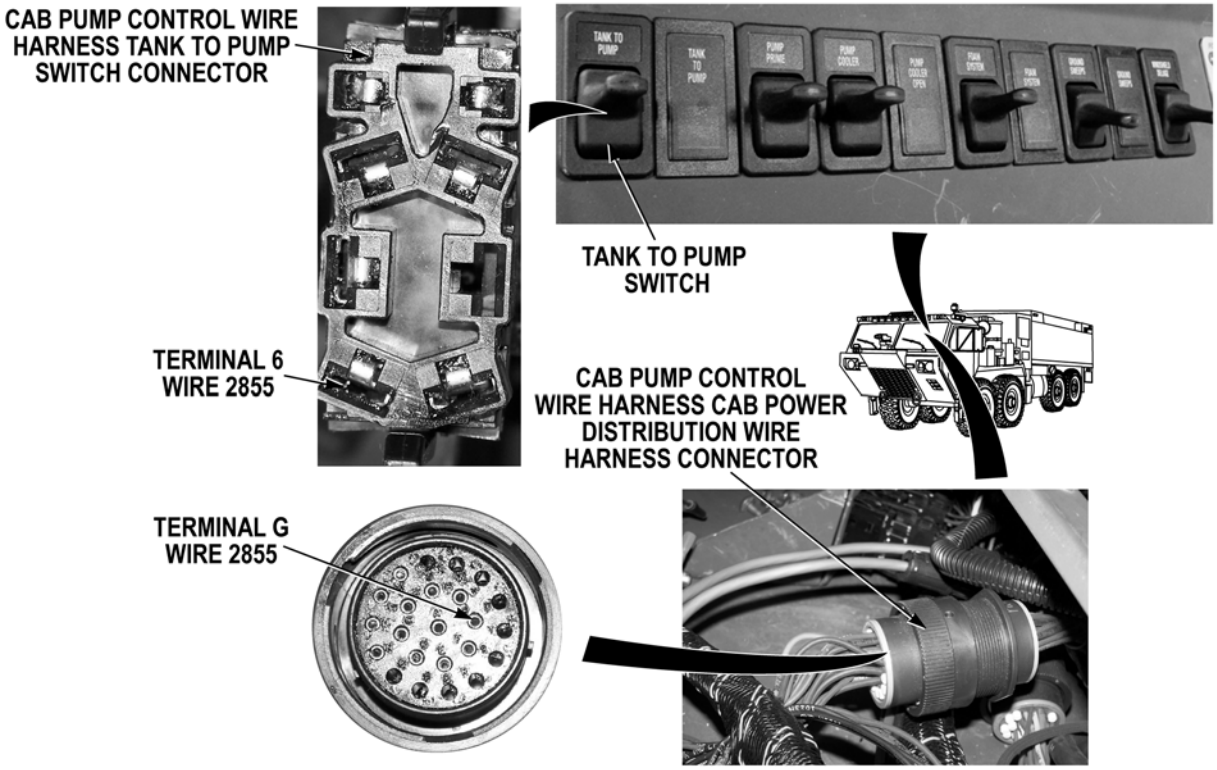
If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

Step 22. Check for continuity across cab power distribution wire harness wire 2855 (red) from relay 5 connector, terminal 1 to relay 5 connector, terminal 5.

a. If there is continuity, replace relay 5 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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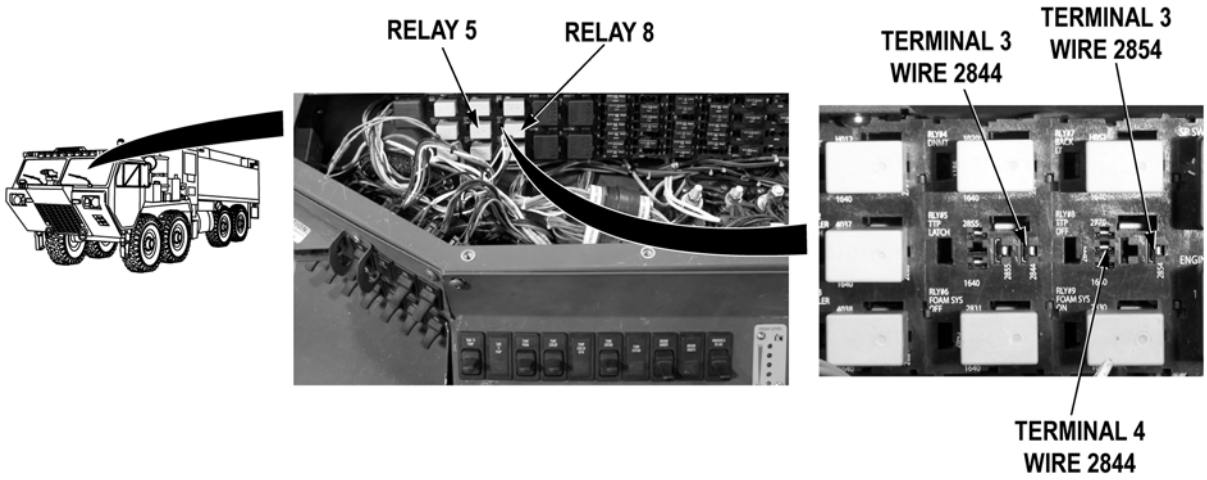
Step 23. Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 2855 (red) from cab pump control wire harness TANK TO PUMP switch connector, terminal 6 to cab pump control wire harness connector, terminal G.

a. If there is continuity, repair wire 2855 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2855 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 24. Remove relay 8 (WP 0242). Check for 22 to 28 VDC between cab power distribution wire harness wire 2854 (red) at relay 8 connector, terminal 3 and a known good ground.

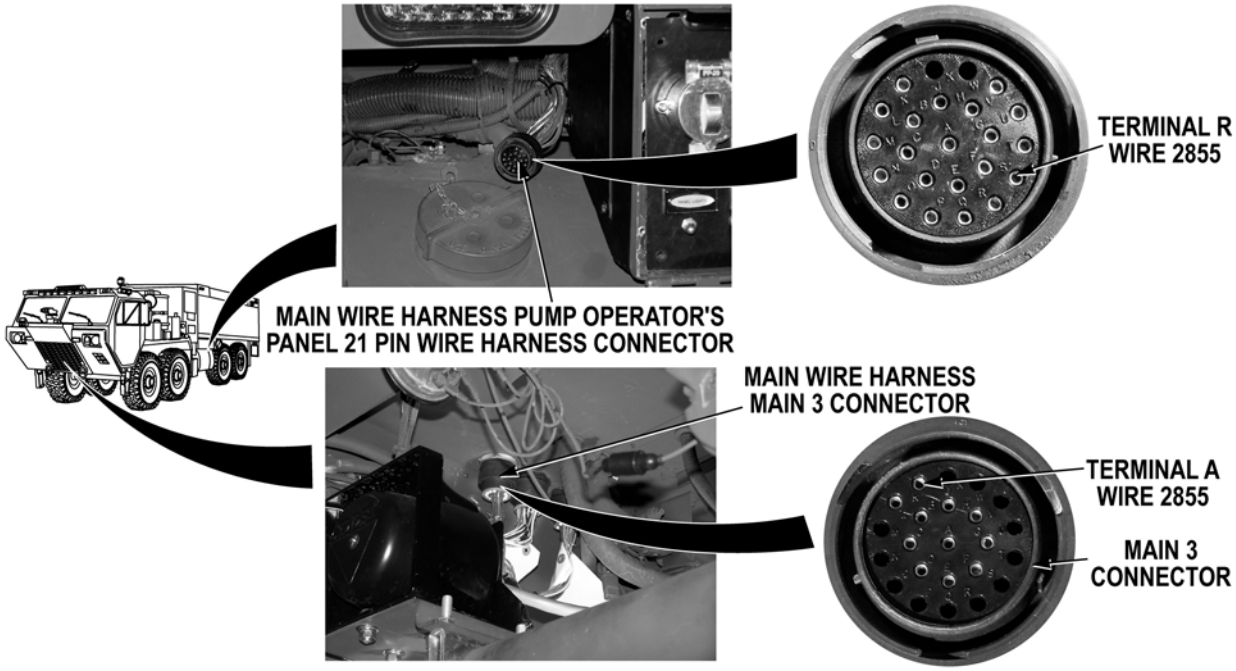
If 22 to 28 VDC are not present, replace cab power distribution wire harness and block (WP 0280).

Step 25. Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab power distribution wire harness wire 2844 (white) from relay 8 connector, terminal 4 to relay 5 connector, terminal 3.

a. If there is continuity, replace relay 8 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

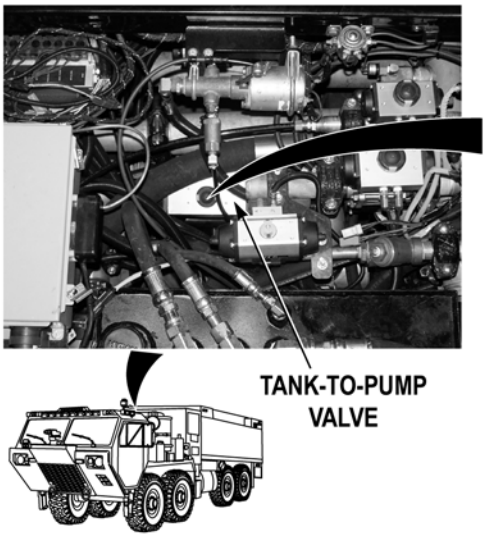
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

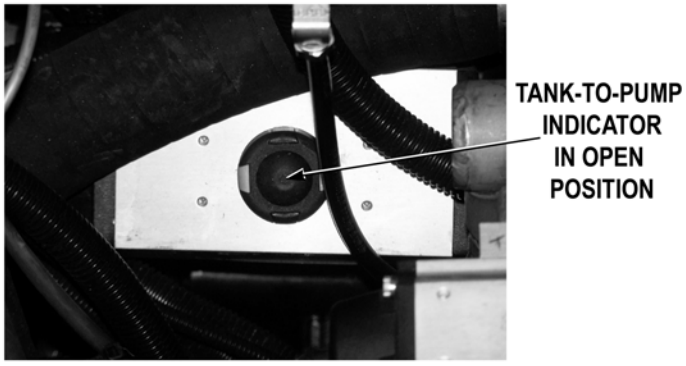
Step 26. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. Disconnect main wire harness main 3 connector. With a test lead set check for continuity across main wire harness wire 2855 (red) from main wire harness pump operator's panel 21 pin wire harness connector, terminal R to main 3 connector, terminal A.

a. If there is continuity, repair wire 2855 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2855 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





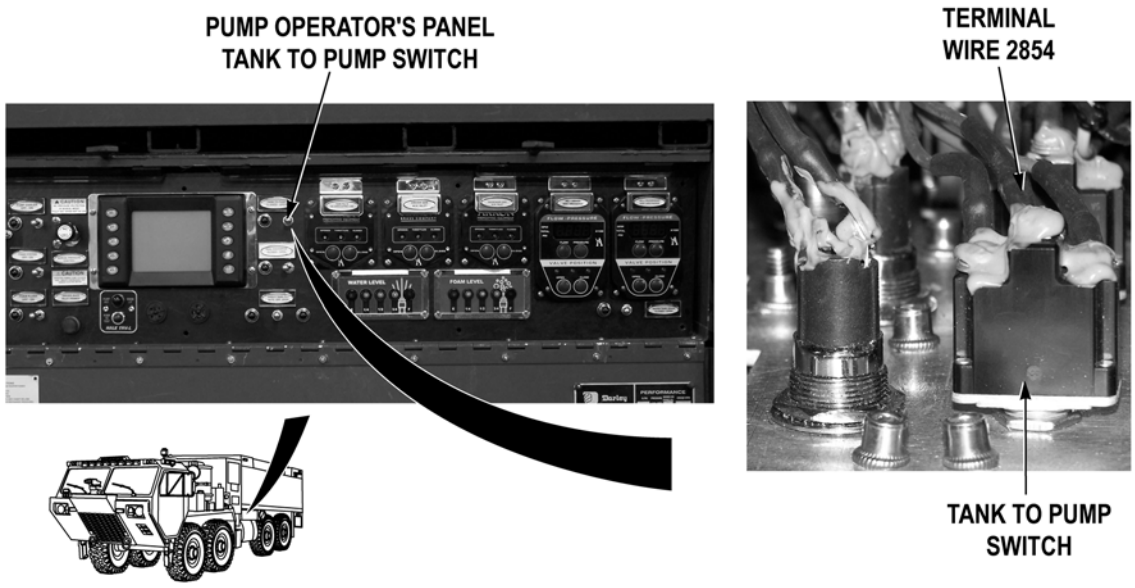
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not operate water pump during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 27. Put pump operator's panel TANK TO PUMP switch to CLOSED position (WP 0004). While an assistant puts cab TANK TO PUMP switch to open position (WP 0004), check if tank-to-pump valve operates to open position.

If tank-to-pump valve does not operate to open position, go to Step 33.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



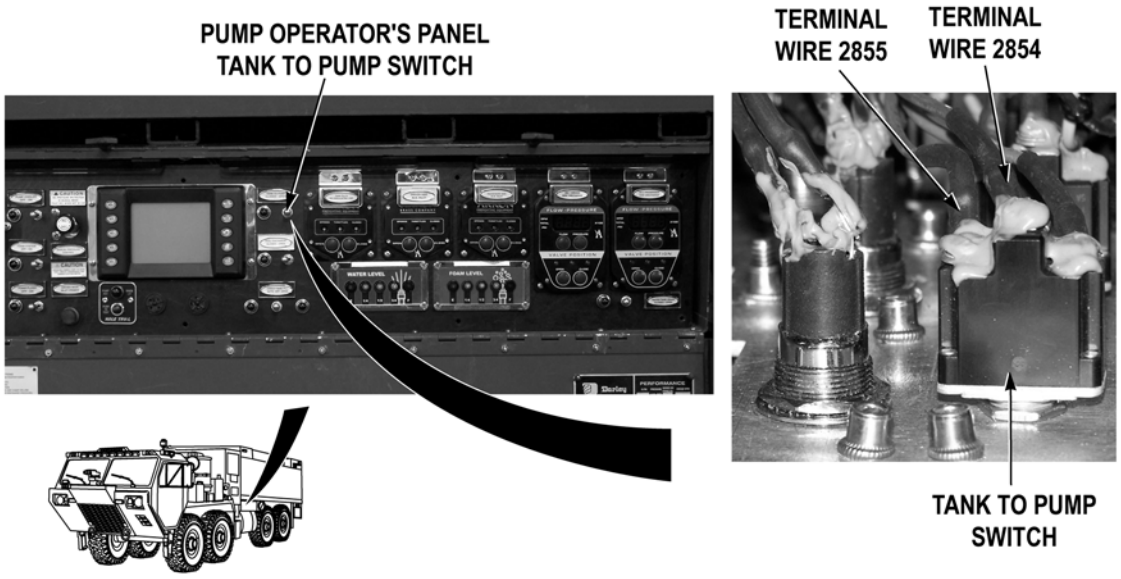
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 28. Open pump operator's panel (WP 0205). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2854 (red) at pump operator's panel wire harness TANK TO PUMP switch, terminal and a known good ground.

If 22 to 28 VDC are not present, go to Step 31.

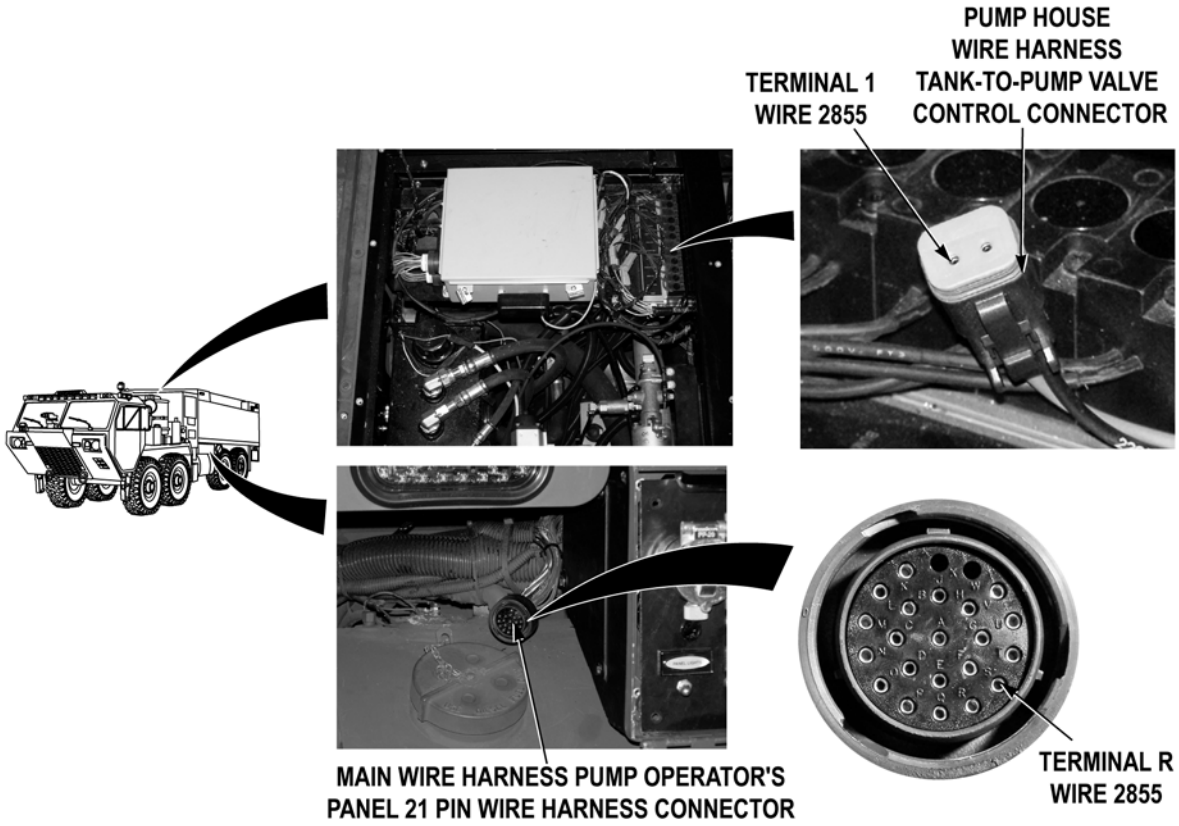
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 29. Pull battery disconnect switch to off position (WP 0007). Check for continuity across pump operator's panel TANK TO PUMP switch, from terminal wire 2854 (red) to terminal wire 2855 (red), when switch is in open position.

If there is no continuity, replace pump operator's panel TANK TO PUMP switch (WP 0219).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

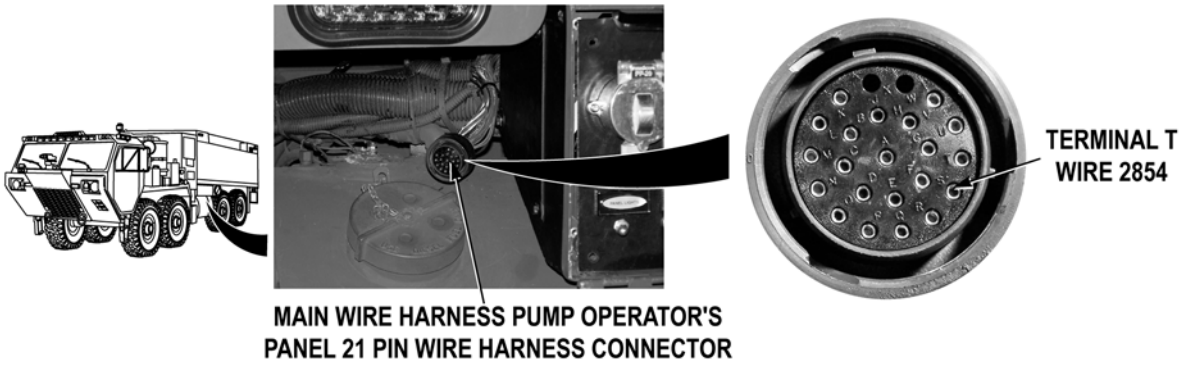


Step 30. Disconnect main wire harness pump operator's panel 21 wire harness connector. Disconnect pump house wire harness tank-to-pump valve control connector. With a test lead set, check for continuity across main wire harness wire 2855 (red) from main wire harness pump operator's panel 21 pin wire harness connector, terminal R to pump house wire harness tank-to-pump valve control connector, terminal 1.

a. If there is continuity, repair wire 2855 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 2855 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



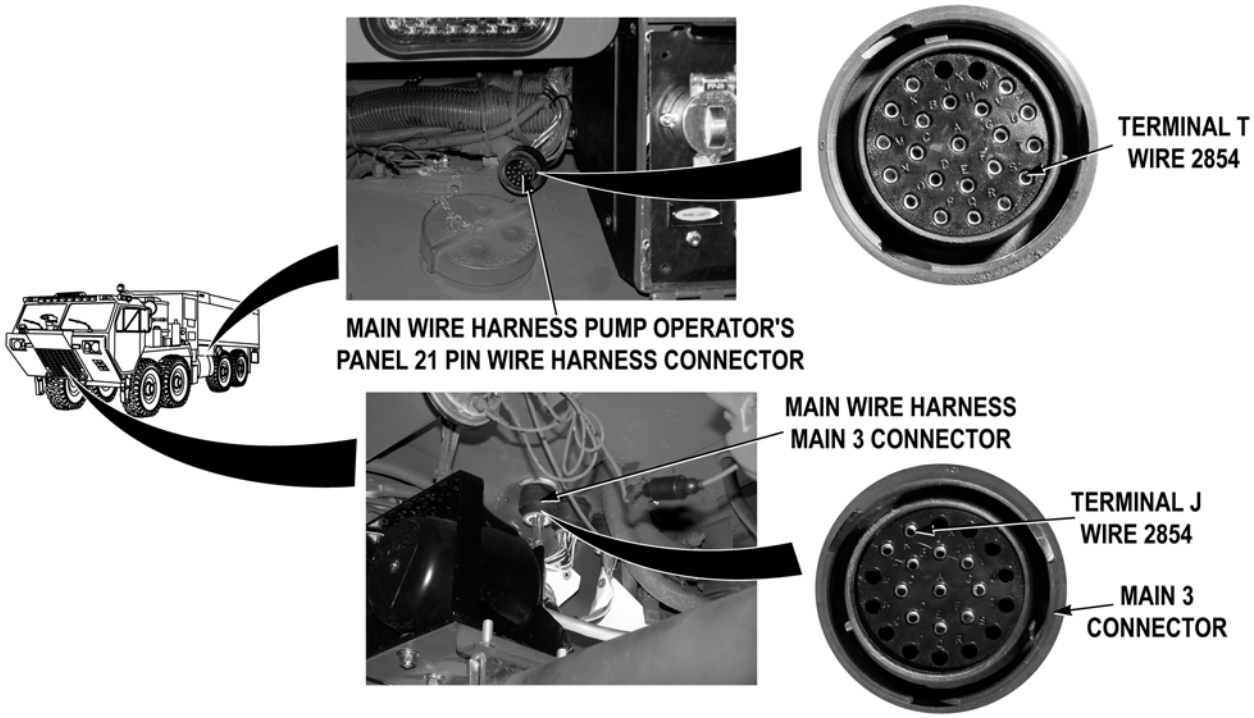
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 31. Disconnect main wire harness pump operator’s panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2854 (red) at main wire harness pump operator’s panel 21 pin wire harness connector, terminal T and a known good ground.

If 22 to 28 VDC are present, repair wire 2854 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 32. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2854 (red) from main 3 connector, terminal J to main wire harness pump operator's panel 21 pin wire harness connector, terminal T.

a. If there is continuity, repair wire 2854 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2854 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

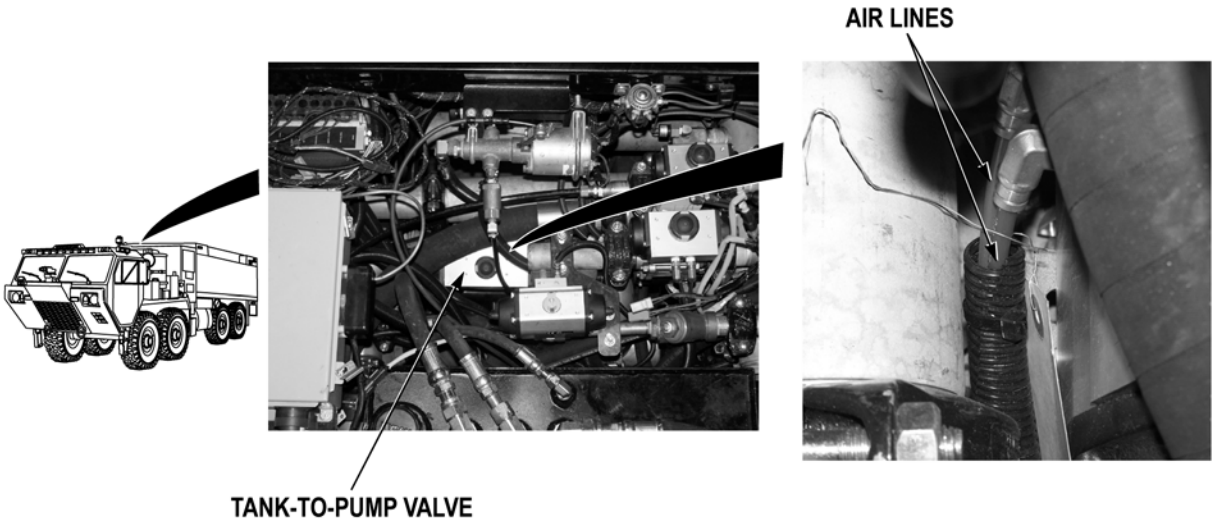
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage pump PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

Step 33. Put cab TANK TO PUMP switch to close position (WP 0004) and release. While an assistant puts cab UNDER TRUCK NOZZLES switch to on position (WP 0004), check if under truck nozzles valve operates to open position.

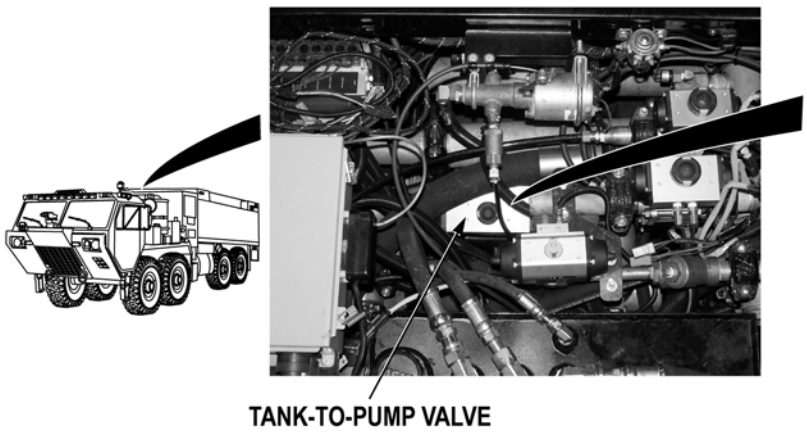
If under truck nozzles valve does not operate to open position, go to Step 36.

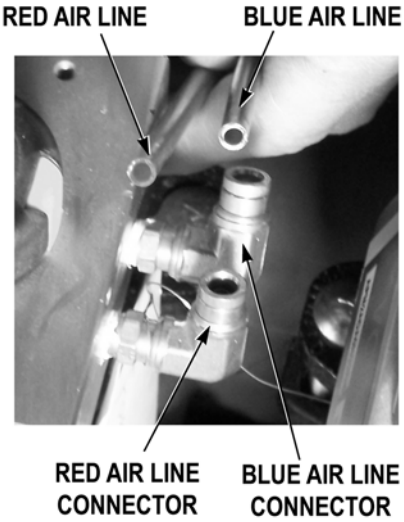


Step 34. Put cab UNDER TRUCK NOZZLES switch to off position (WP 0004). Inspect air lines from air control valve manifold to tank-to-pump valve for kinks and damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

NOTE

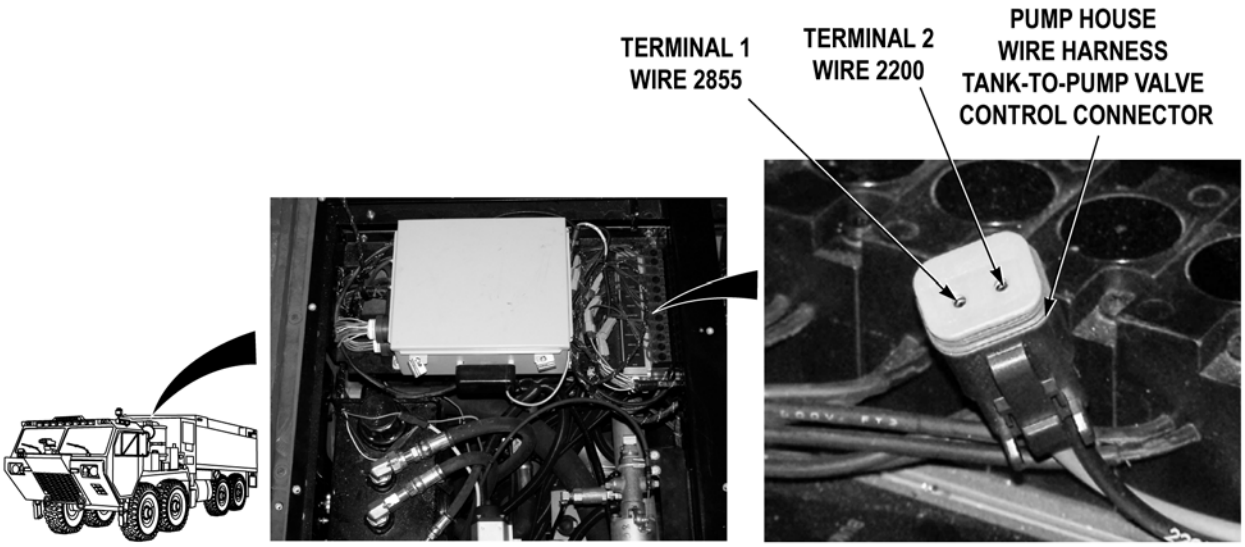
Air pressure is checked by disconnecting air lines at tank-to-pump valve and observing air pressure escaping from air line, when tank-to-pump control valve is activated. Air will escape from blue air line when TANK TO PUMP switch is put to open position, and escape from red air line when TANK TO PUMP switch is put to closed position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 35. Disconnect air lines at tank-to-pump valve. While an assistant puts cab or pump operator's panel TANK TO PUMP switch to open and close positions (WP 0004), check if air pressure is present at tank-to-pump valve.

a. If there is air pressure, replace tank-to-pump valve (WP 0324).

b. If there is no air pressure, replace tank-to-pump control valve (WP 0270).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 36. Connect air lines at tank-to-pump valve. Disconnect pump house wire harness tank-to-pump control valve connector. Put cab or pump operator's panel TANK TO PUMP switch to open position (WP 0004) and release. With a test lead set, check for 22 to 28 VDC between wire 2855 (red) at pump house wire harness tank-to-pump control valve connector, terminal 1 and a known good ground.

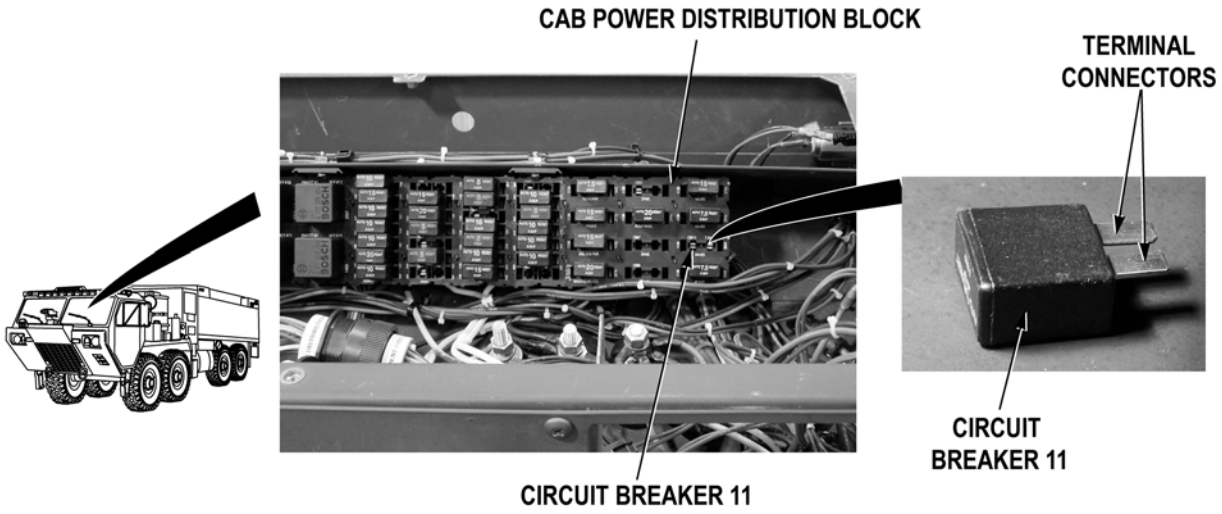
If 22 to 28 VDC are not present, repair wire 2855 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness.

Step 37. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness tank-to-pump control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace tank-to-pump control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



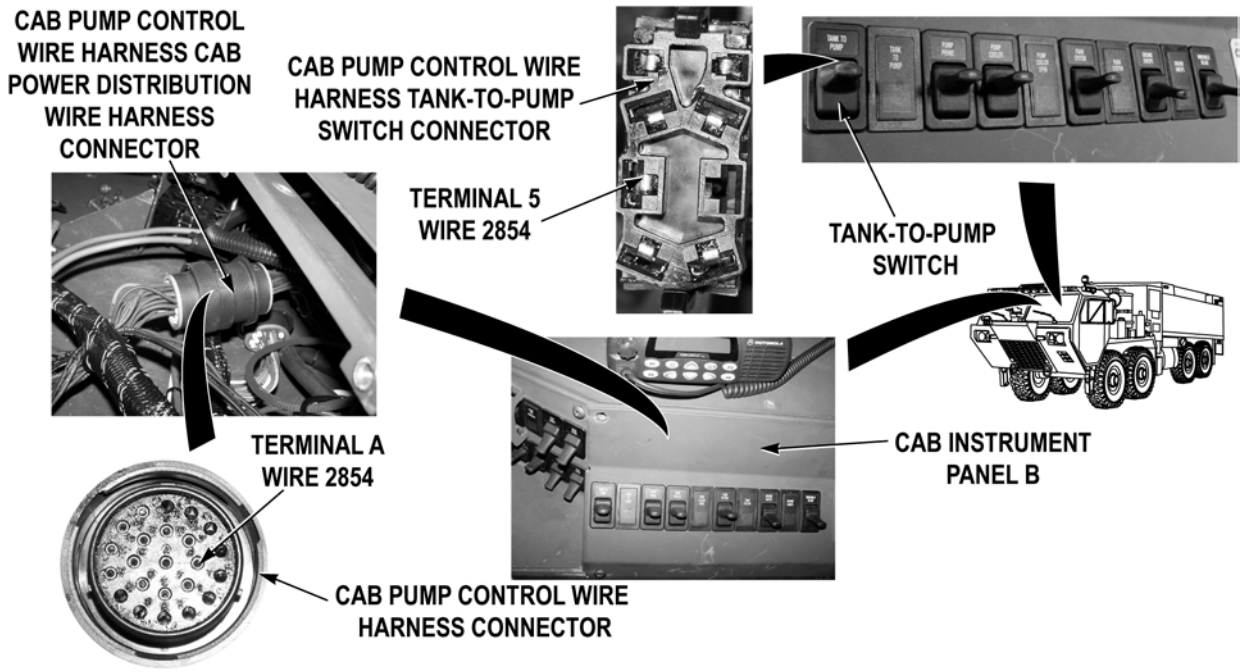
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 38. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 11 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker 11 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 39. Install circuit breaker 11 (WP 0240). Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 2854 (red) from TANK TO PUMP switch connector, terminal 5 to cab pump control wire harness connector, terminal A.

a. If there is continuity, repair wire 2854 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2854 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

UNDER TRUCK NOZZLES DO NOT OPERATE WHEN SELECTED

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

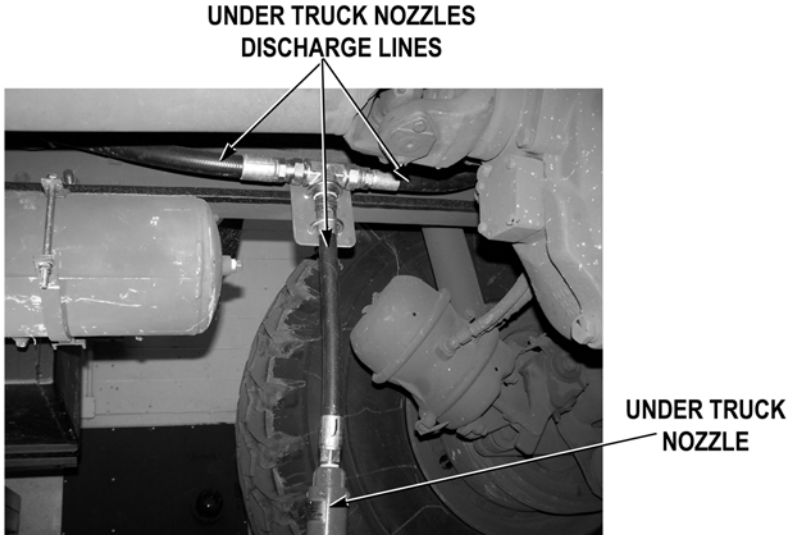
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0024
WP 0197
WP 0240
WP 0270

References (continued)
WP 0280
WP 0281
WP 0293
WP 0303
WP 0322
WP 0325
WP 0341
WP 0375
WP 0384

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

UNDER TRUCK NOZZLES DO NOT OPERATE WHEN SELECTED



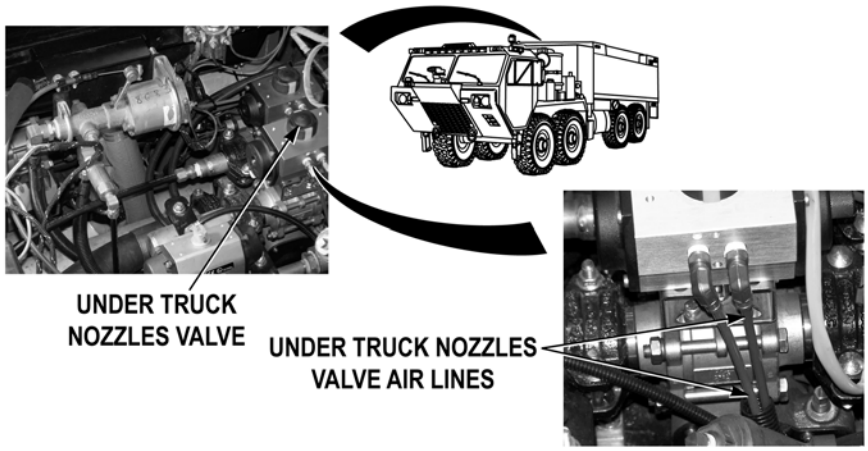
Step 1. Check under truck nozzles and discharge lines for kinks and damage.

If under truck nozzles or discharge lines are kinked or damaged, replace damaged under truck nozzles (WP 0384) and discharge lines (WP 0322).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

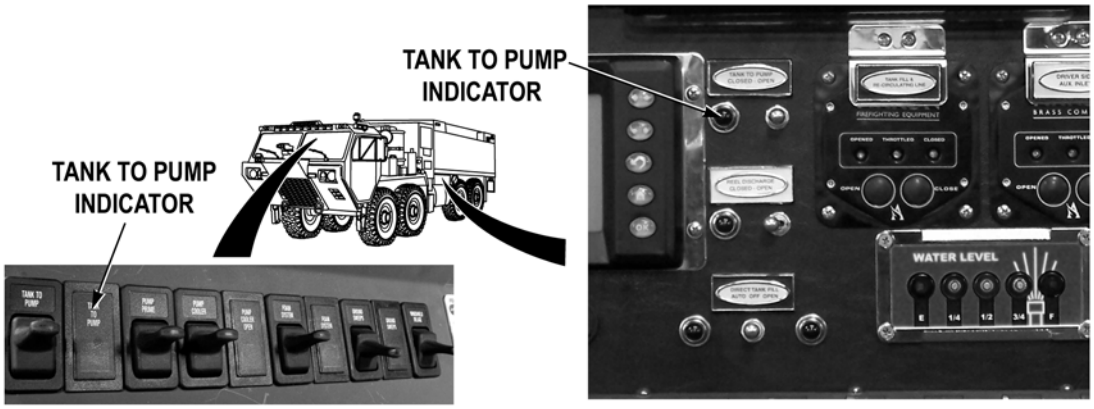
Step 2. Push battery disconnect switch to on position (WP 0007). Set up system to pump from onboard water tank (WP 0018). Put cab under truck nozzles switch to on position (WP 0004). Check if water is delivered to all under truck nozzles.

If water is delivered to at least one under truck nozzle, go to Step 16.



Step 3. Remove pump house panel K (WP 0341). Inspect air lines from air control valve manifold to under truck nozzle valve for kinks and damage.

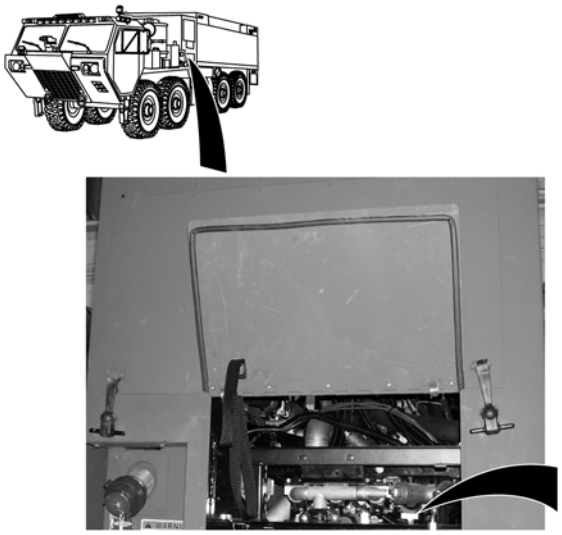
If air lines are kinked or damaged, replace damaged air lines (WP 0375).

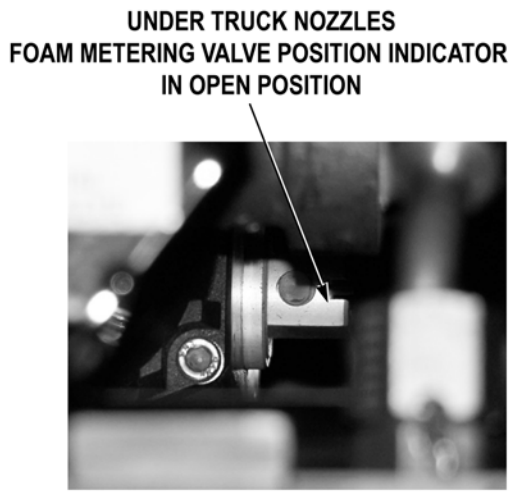


Step 4. Push battery disconnect switch to on position (WP 0007). Put cab or pump operator's panel TANK TO PUMP switch to OPEN position (WP 0004). Check if TANK TO PUMP indicator illuminates.

If TANK TO PUMP indicator does not illuminate, go to Step 14.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





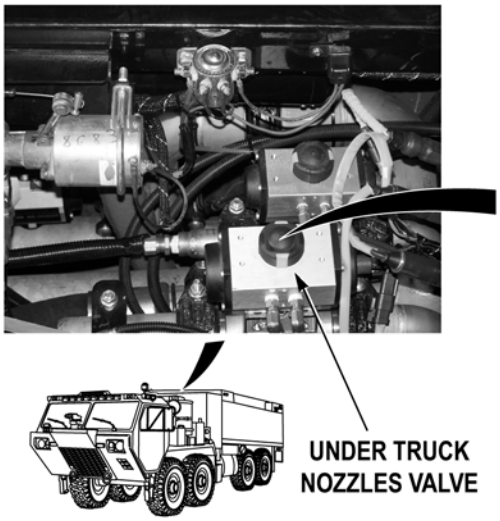
NOTE

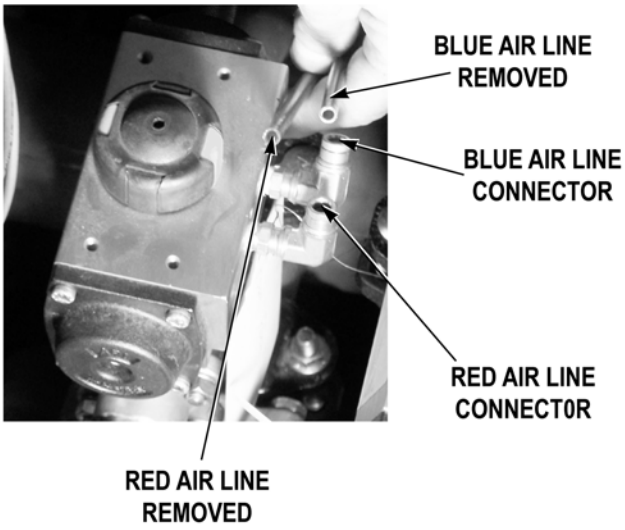
- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 5. Put TANK TO PUMP switch to closed position (WP 0004). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Open pump house access door assembly (WP 0009). Put FOAM SYSTEM switch to on position (WP 0004). While an assistant puts UNDER TRUCK NOZZLES switch to on position (WP 0004), check if under truck nozzles foam metering valve operates to open position.

If under truck nozzles foam metering valve does not operate to open position, go to Step 9.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

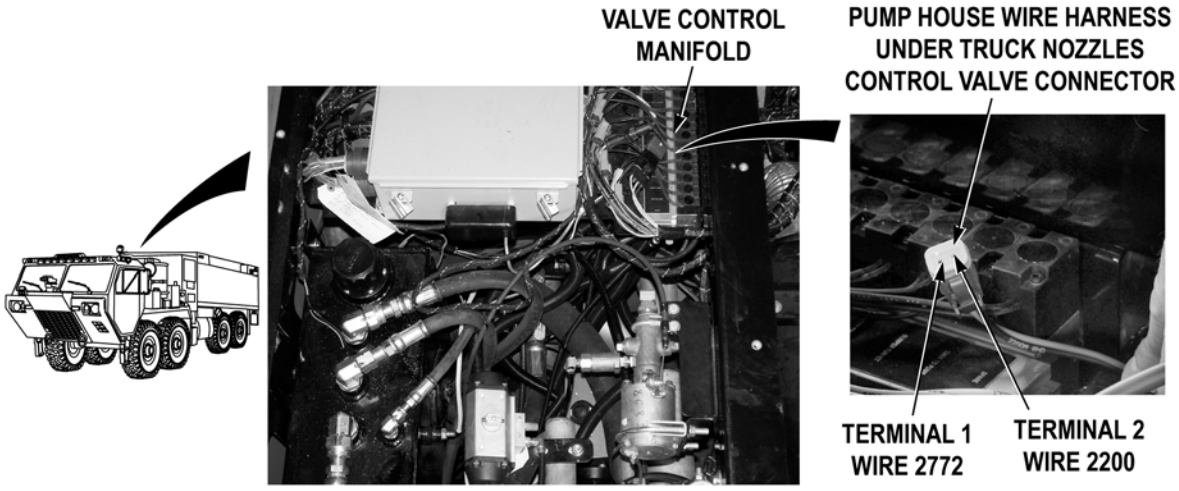
NOTE

Air pressure is checked by disconnecting air lines at under truck nozzles valve and observing air pressure escaping from air lines, when under truck nozzles control valve is activated. Air will escape from blue air line when UNDER TRUCK NOZZLES switch is put to on position, and escape from red air line when UNDER TRUCK NOZZLES switch is put to off position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 6. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). Put FOAM SYSTEM switch to off position (WP 0004). Disconnect air lines at under truck nozzles valve. While an assistant puts UNDER TRUCK NOZZLES switch to on and off position (WP 0004), check if air pressure is present at under truck nozzles valve.

If air pressure is present, replace under truck nozzles valve (WP 0325).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 7. Connect air lines at under truck nozzles valve. Disconnect pump house wire harness under truck nozzles control valve connector. Put UNDER TRUCK NOZZLES switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 2772 (gray) at pump house wire harness under truck nozzles control valve connector, terminal 1 and a known good ground.

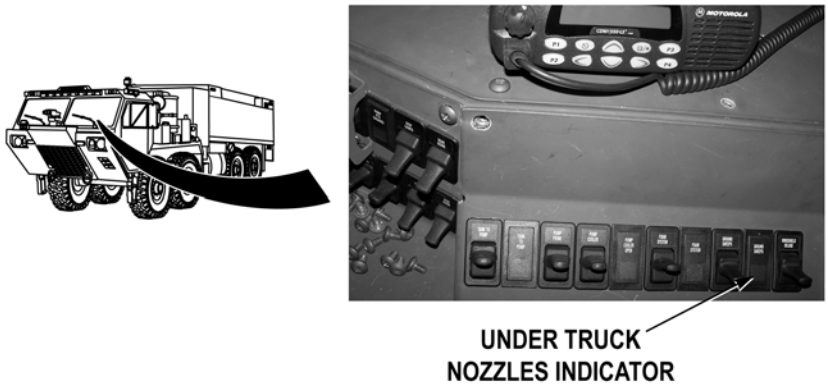
If 22 to 28 VDC are not present, go to Step 10.

Step 8. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness under truck nozzles control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace under truck nozzles control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Check if UNDER TRUCK NOZZLES indicator is illuminated (WP 0004).

If UNDER TRUCK NOZZLES indicator is not illuminated, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

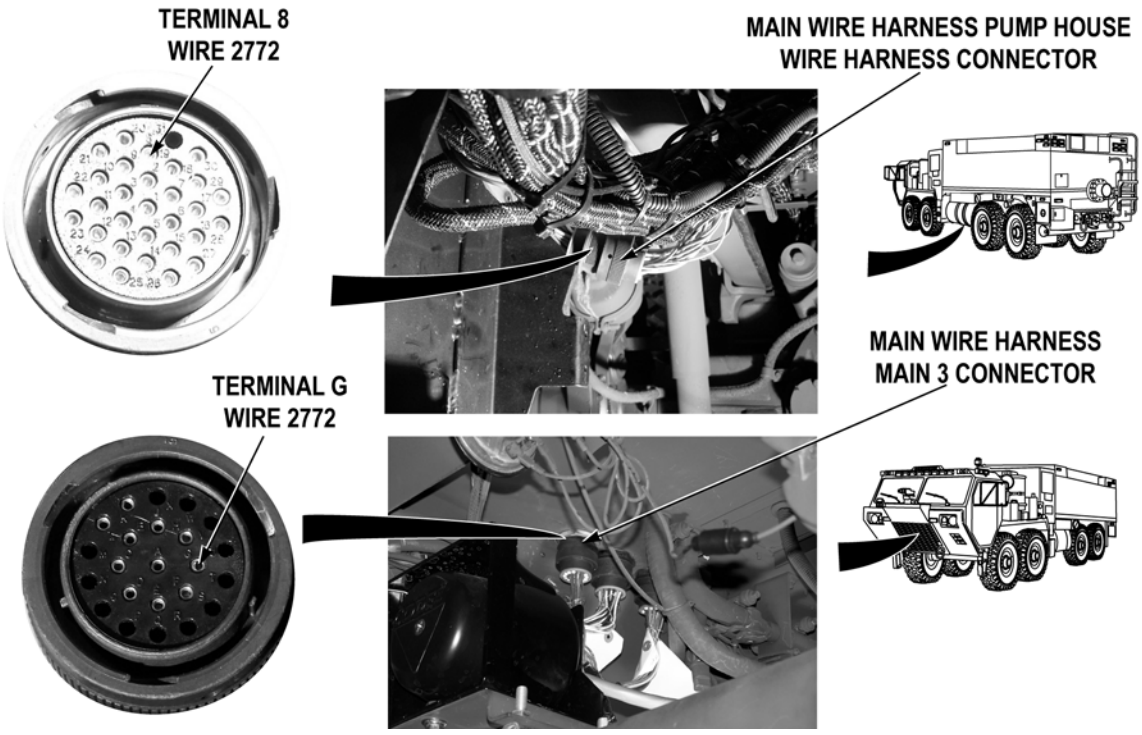
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 10. Put UNDER TRUCK NOZZLES switch to on position (WP 0004). Disconnect main wire harness pump house wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2772 (gray) at main wire harness pump house wire harness connector, terminal 8 and a known good ground.

If 22 to 28 VDC are present, repair wire 2772 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

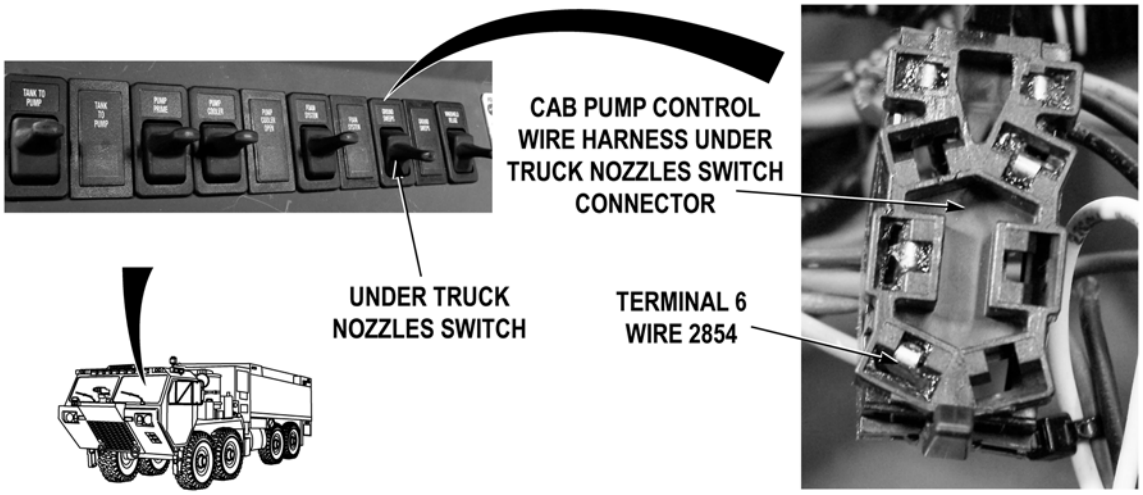


Step 11. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2772 (gray) from main 3 connector, terminal G to main wire harness pump house wire harness connector, terminal 8.

a. If there is continuity, repair wire 2772 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2772 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



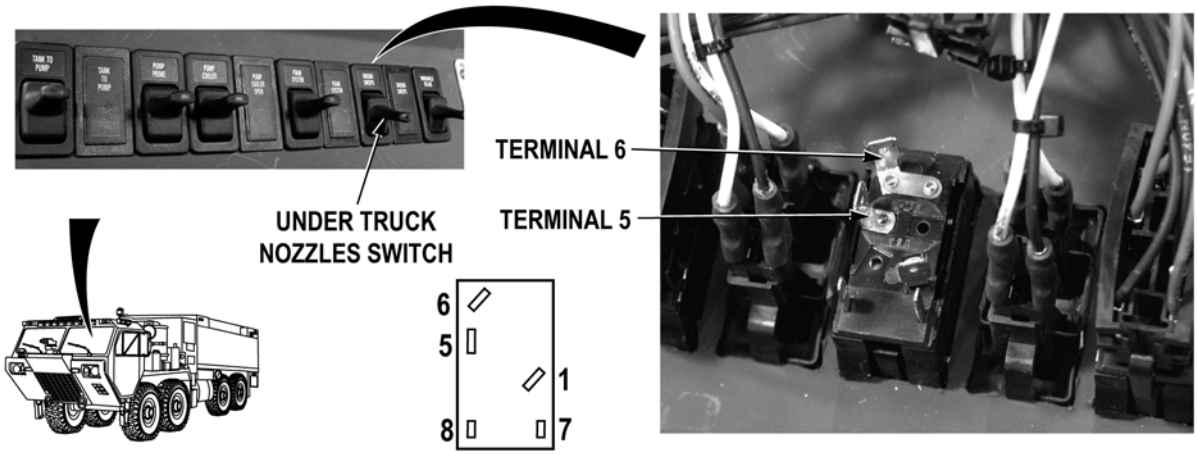
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 12. Put UNDER TRUCK NOZZLES switch to off position (WP 0004). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness UNDER TRUCK NOZZLES switch connector. Check for 22 to 28 VDC between cab pump control wire harness wire 2854 (red) at UNDER TRUCK NOZZLES switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are not present, repair wire 2854 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

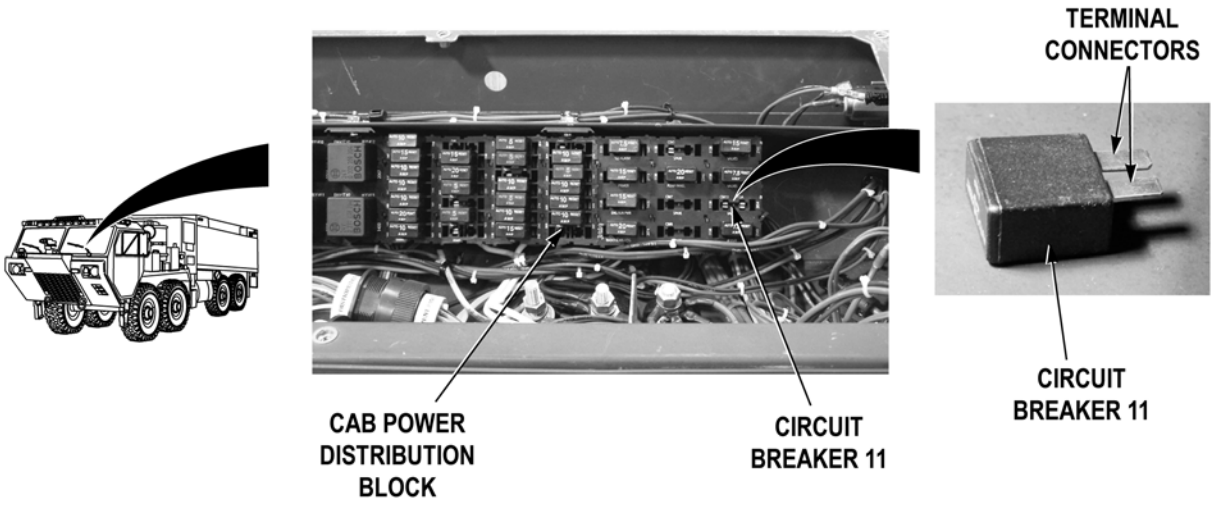


Step 13. Pull battery disconnect switch to off position (WP 0007). Check for continuity across UNDER TRUCK NOZZLES switch, from terminal 5 to terminal 6, when switch is in on position.

a. If there is continuity, repair wire 2772 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, replace UNDER TRUCK NOZZLES switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



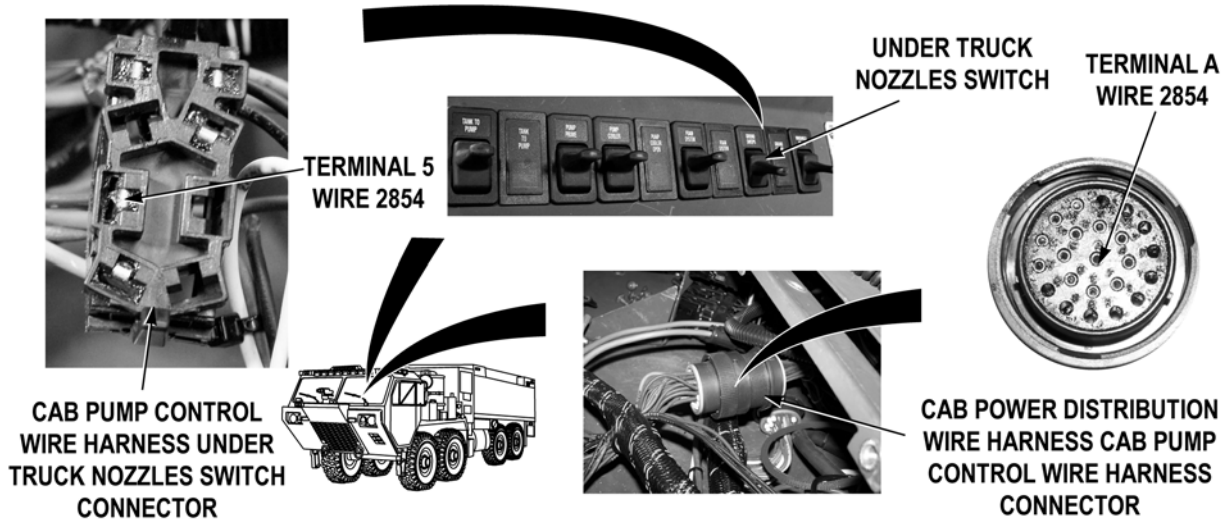
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 11 from cab power distribution block (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker 11 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

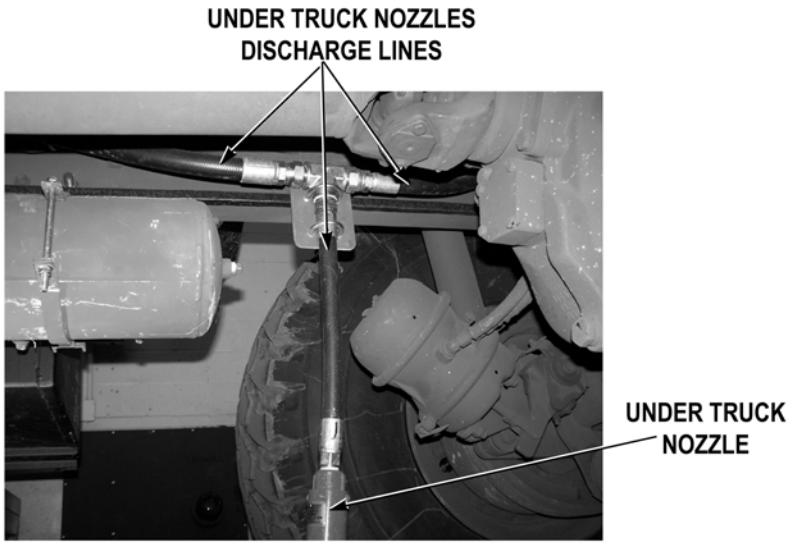


Step 15. Install circuit breaker 11 (WP 0240). Disconnect cab power distribution wire harness cab pump control wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 2854 (red) from cab pump control wire harness UNDER TRUCK NOZZLES switch connector, terminal 5 to cab pump control wire harness connector, terminal A.

a. If there is continuity, repair wire 2854 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2854 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Remove non-operating under truck nozzle (WP 0384). Check under truck nozzle for contamination and debris.

a. If under truck nozzle is contaminated, clean debris or replace under truck nozzle (WP 0384).

b. If under truck nozzle is free from contamination, replace plugged discharge line (WP 0384).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER PUMP IS NOISY

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(WP 0399, Item 17)

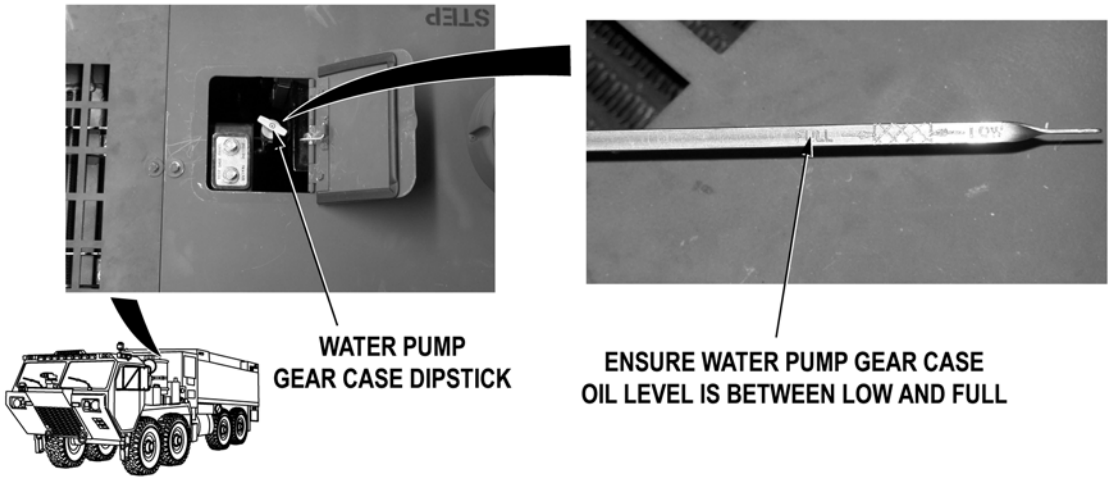
References
WP 0004
WP 0015
WP 0018

References (continued)
WP 0126
WP 0156

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WATER PUMP IS NOISY



Step 1. Open pump house panel K access door. Check water pump gear case oil level (WP 0126).

If oil level is low, fill to correct level (WP 0126) and go to Step 2.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

⚠ CAUTION

Pump must be primed when operating water pump. Failure to prime pump before operating water pump may damage equipment.

Step 2. Start engine (TM 9-2320-279-10). Perform setup for Pumping From Onboard Water Tank (WP 0018). Ensure pump is primed (WP 0015). Push pump operator's panel TANK FILL & RE-CIRCULATING LINE valve control OPEN switch (WP 0004). Check if water pump is excessively noisy.

a. If water pump is not excessively noisy, fault corrected.

b. If water pump is excessively noisy, replace water pump (WP 0156).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER PUMP PTO DOES NOT ENGAGE WHEN SELECTED

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0094
WP 0136
WP 0151

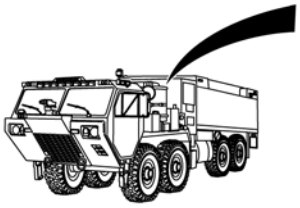
References (continued)
WP 0152
WP 0153
WP 0197
WP 0203
WP 0240
WP 0279
WP 0280
WP 0293

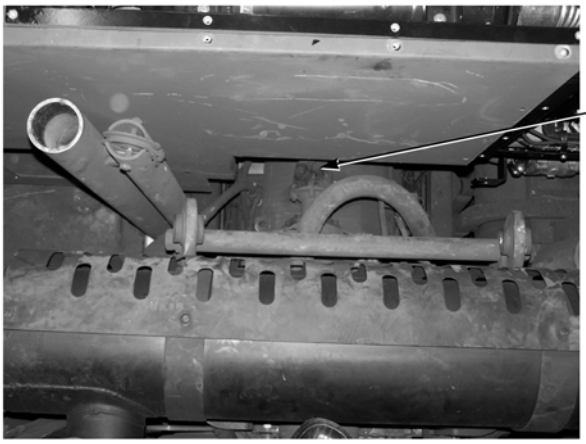
Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WATER PUMP PTO DOES NOT ENGAGE WHEN SELECTED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





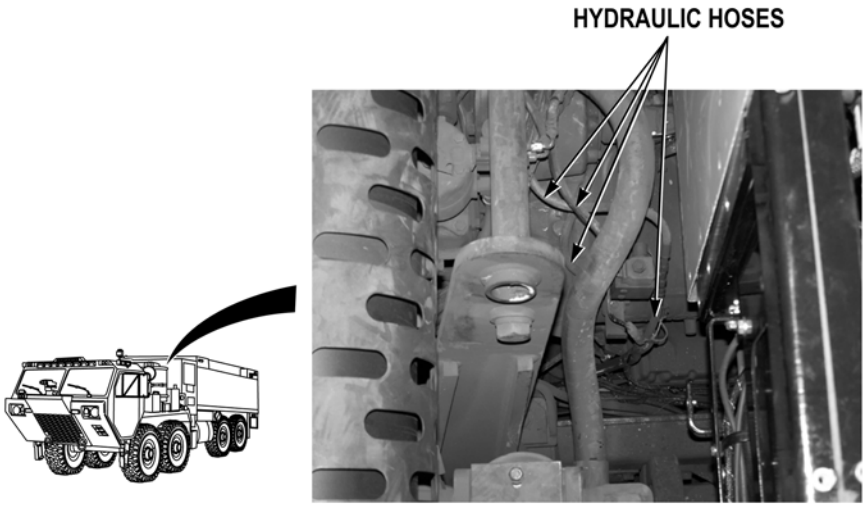
WARNING

Stay clear of rotating PUMP PTO drive shaft. Clothing or other material may catch on rotating PUMP PTO drive shaft, causing damage to equipment or serious injury or death to personnel.

Step 1. Push battery disconnect switch to on position (WP 0007). Start engine (TM 9-2320-279-10). While an assistant puts cab PUMP PTO switch to on position (WP 0004), check if PUMP PTO drive shaft rotates.

If PUMP PTO drive shaft rotates and PUMP PTO ENGAGED indicator is not illuminated, troubleshoot PUMP PTO ENGAGED Indicator Does Not Illuminate (Cab) (WP 0094).

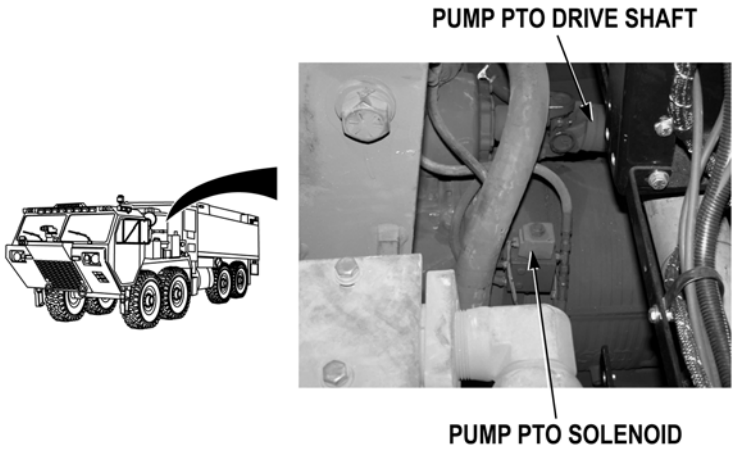
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Put cab PUMP PTO switch to off position (WP 0004). Turn engine OFF (TM 9-2320-279-10). Check if hydraulic hoses between PUMP PTO solenoid, PUMP PTO, and transmission are free from kinks, leaks, and damage.

If hoses are kinked, leak or are damaged, replace damaged hose(s) (WP 0136).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

PUMP PTO solenoid operation is checked by listening to audible click and feeling for vibrations at PUMP PTO solenoid. When PUMP PTO switch is put to on position (WP 0004). Do not start engine during this procedure. Failure to comply may result in serious injury or death to personnel.

Step 3. Push battery disconnect switch to on position (WP 0007). While an assistant puts cab PUMP PTO switch to on and off positions (WP 0004), check if PUMP PTO solenoid operates.

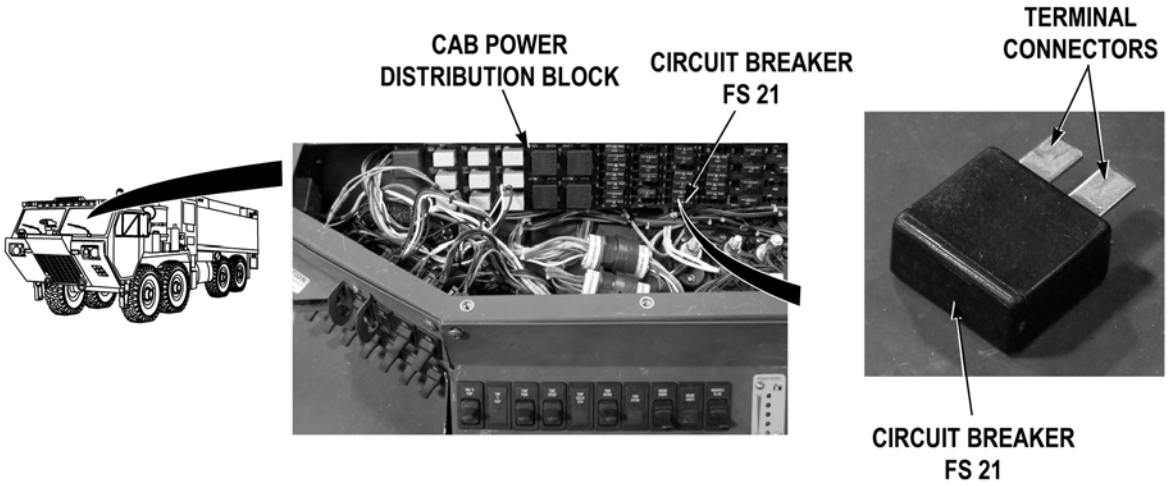
If PUMP PTO solenoid does not operate, go to Step 5.

Step 4. Pull battery disconnect switch to off position (WP 0007). Check PUMP PTO drive shaft for loose fasteners, sloppy slip collar connection, binding, and damage.

a. If PUMP PTO drive shaft is free from loose fasteners, sloppy slip collar connection, binding, and damage, replace PUMP PTO (WP 0151).

b. If PUMP PTO drive shaft shows indication of a sloppy slip collar connector, binding, or damaged, replace PUMP PTO drive shaft (WP 0152).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



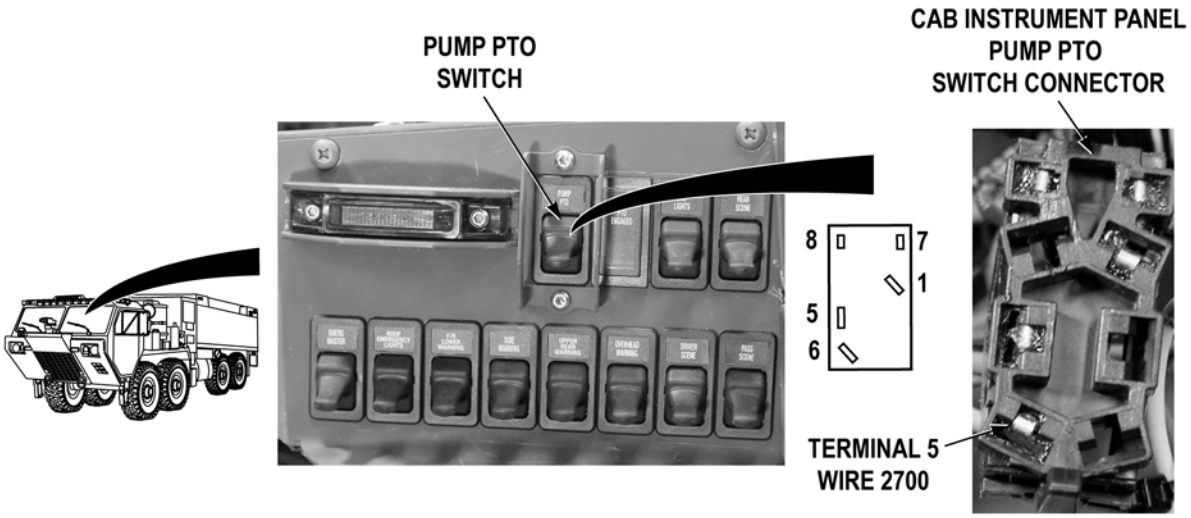
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 21 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 21 (WP 0240).

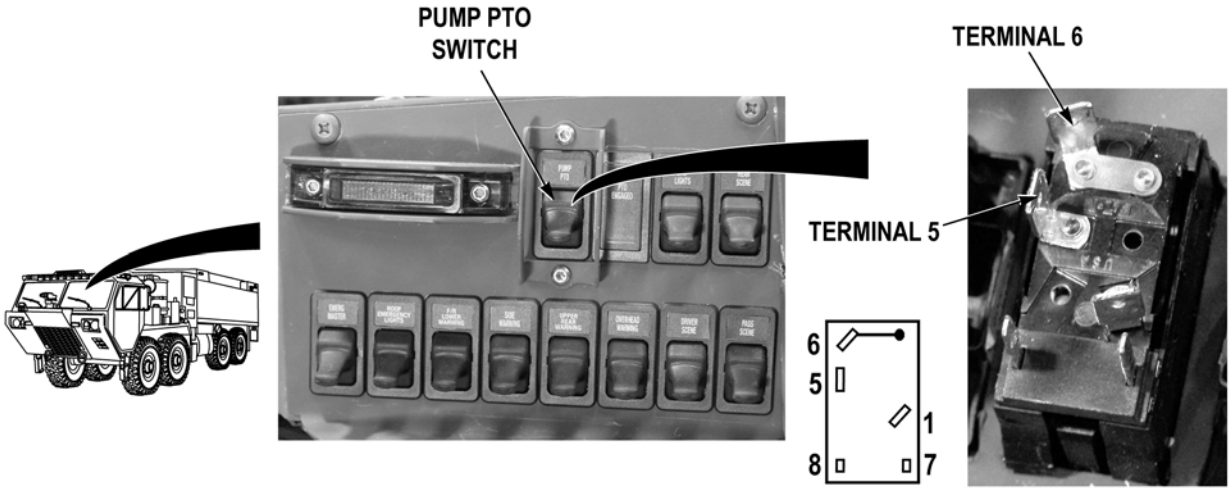
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Install circuit breaker FS 21 (WP 0240). Remove cab instrument panel C (WP 0203). Disconnect cab instrument panel wire harness PUMP PTO switch connector. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between cab instrument panel wire harness wire 2700 (red) at PUMP PTO switch connector, terminal 5 and a known good ground.

If 22 to 28 VDC are not present, go to Step 11.

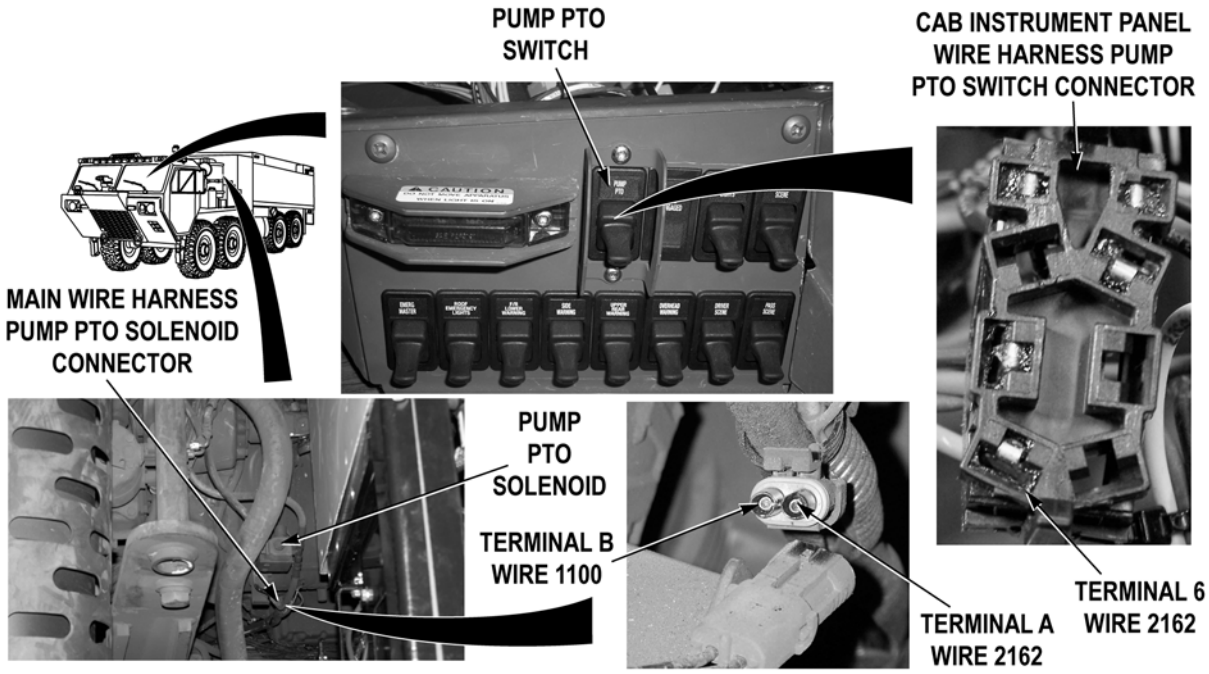
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Pull battery disconnect switch to off position (WP 0007). Check for continuity across PUMP PTO switch, from terminal 5 to terminal 6, when switch is put to on position.

If there is no continuity, replace PUMP PTO switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Do not start engine during this procedure. The proximity of solenoid and PUMP PTO drive shaft may allow clothing or other material to catch on rotating PUMP PTO drive shaft. Failure to comply may result in serious injury or death to personnel.

Step 8. Disconnect main wire harness PUMP PTO solenoid connector. With a test lead set, check for continuity across wire 2162 (white) from cab instrument panel wire harness PUMP PTO switch connector, terminal 6 to main wire harness PUMP PTO solenoid connector, terminal A.

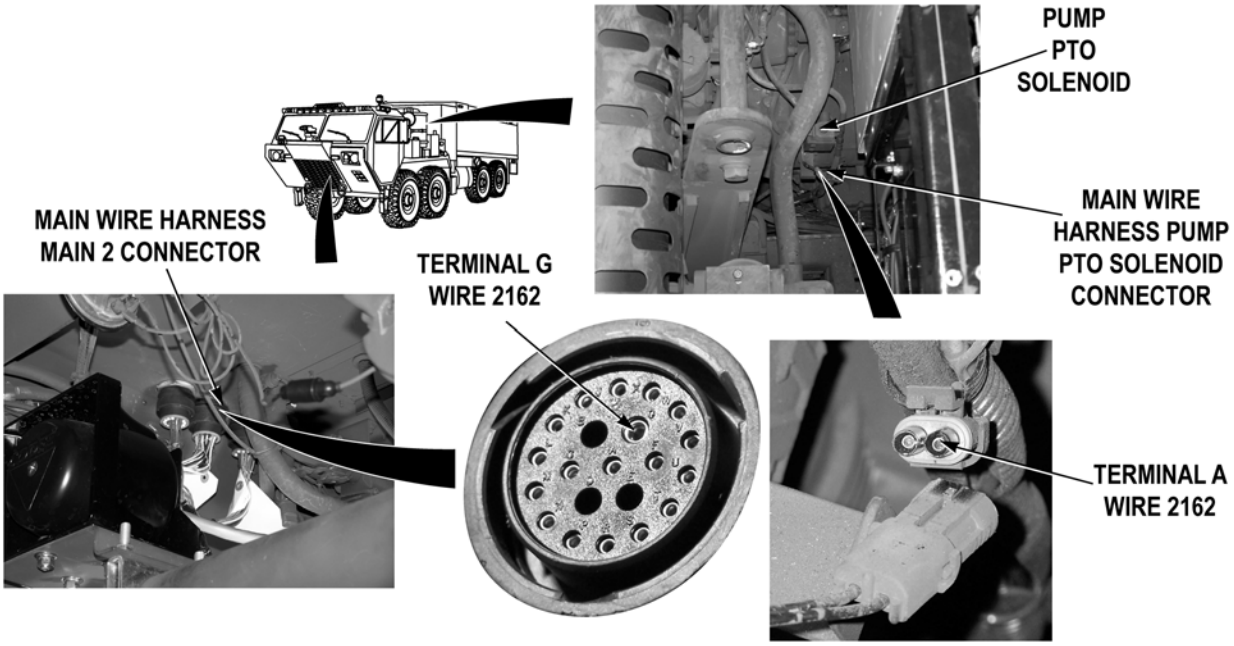
If there is no continuity, go to Step 10.

Step 9. Check for continuity across main wire harness wire 1100 (black) from PUMP PTO solenoid connector, terminal B to a known good ground.

a. If there is continuity, replace PUMP PTO solenoid (WP 0153).

b. If there is no continuity, repair wire 1100 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

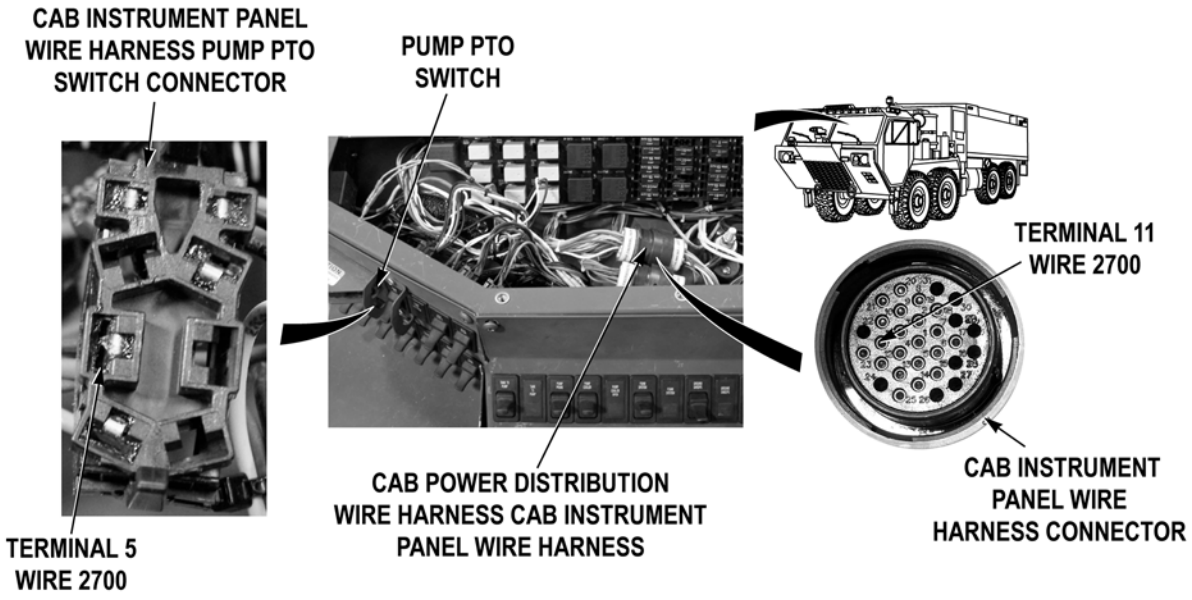


Step 10. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 2162 (white) from main 2 connector, terminal G to PUMP PTO solenoid connector, terminal A.

a. If there is continuity, repair wire 2162 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 2162 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Pull battery disconnect switch to off position (WP 0007). Disconnect cab power distribution wire harness cab instrument panel wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 2700 (red) from cab instrument panel wire harness connector, terminal 11 to PUMP PTO switch connector, terminal 5.

a. If there is continuity, repair wire 2700 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2700 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER TANK DRAIN VALVE DOES NOT OPERATE WHEN SELECTED

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

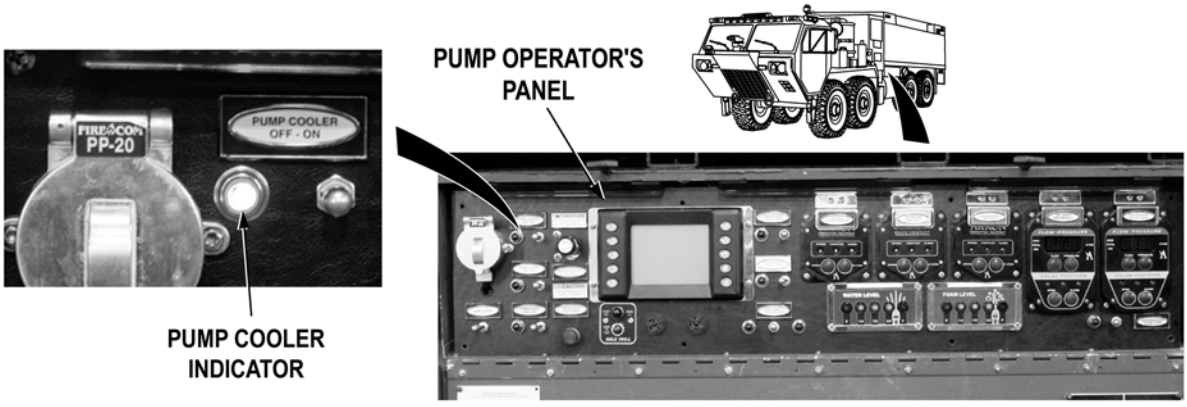
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0010
WP 0170
WP 0203
WP 0205

References (continued)
WP 0218
WP 0240
WP 0270
WP 0280
WP 0281
WP 0293
WP 0303
WP 0304
WP 0341
WP 0375

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

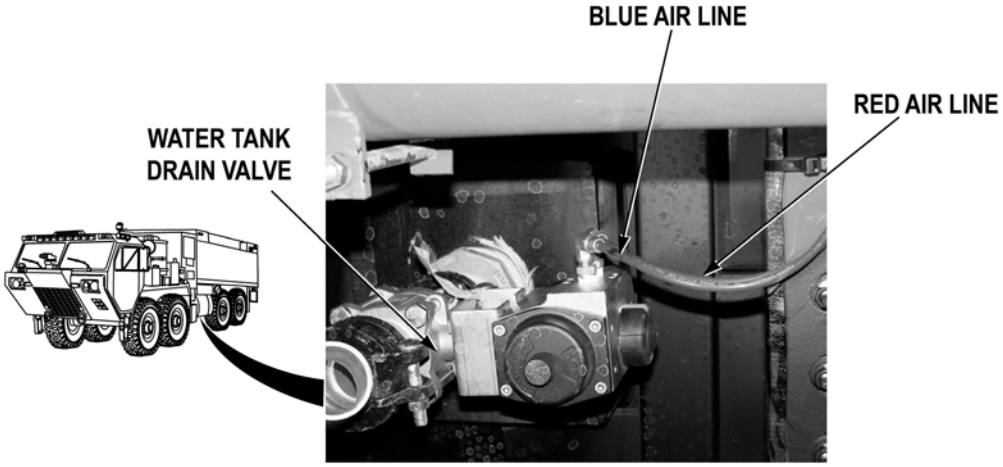
WATER TANK DRAIN VALVE DOES NOT OPERATE WHEN SELECTED



Step 1. Push battery disconnect switch to on position (WP 0007). Open pump operator's panel cover (WP 0010). Put pump operator's panel PUMP COOLER switch to ON position (WP 0004) and release. Check if pump operator's panel PUMP COOLER indicator illuminates.

If pump operator's panel PUMP COOLER indicator does not illuminate, go to Step 11.

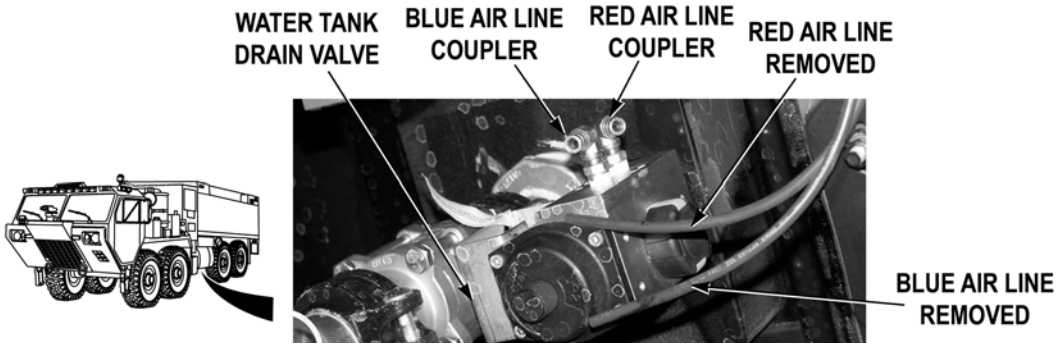
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Put PUMP COOLER switch to OFF position (WP 0004) and release. Remove pump house panel K (WP 0341). Check air lines from air control valve manifold to water tank drain valve for kinks and damage.

If air lines are kinked or damaged, replace damaged air lines (WP 0375).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

- **If air lines are under pressure when they are disconnected, they can whip around and cause injury to personnel. Caution should be exercised when disconnecting air line fittings.**
- **Air lines may be under pressure when control valve is operated. If under pressure, and air lines are disconnected, air lines may whip around and cause injury to personnel. Caution should be exercised when operating control valve with air lines disconnected.**

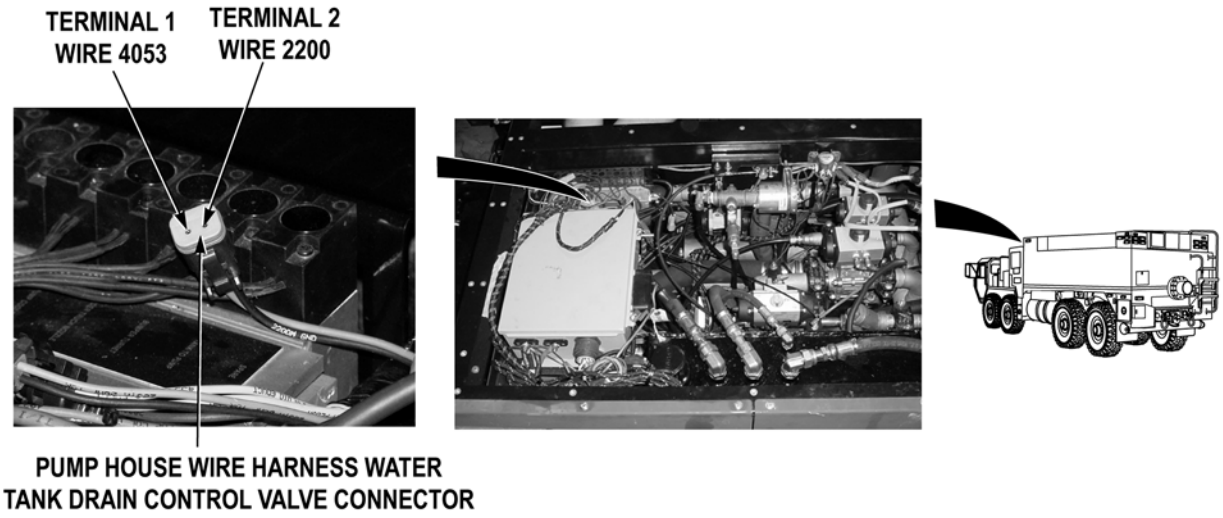
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Do not operate WATER TANK DRAIN switch with blue air line connected to water tank drain valve. If water tank drain opens inadvertently, water will discharge uncontrollably.
- Air pressure is checked by disconnecting air lines at water tank drain valve and observing air pressure escaping from air line, when water tank drain control valve is activated. Air will escape from blue air line when WATER TANK DRAIN switch is put to OPEN position, and escape from red air line when WATER TANK DRAIN switch is put to CLOSED position. System air pressure may drop below 85 psi (586 kPa) during this procedure.

Step 3. If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Disconnect air lines at water tank drain valve. While an assistant puts pump operator's panel WATER TANK DRAIN switch to OPEN and CLOSED positions (WP 0004), check if air pressure is present at water tank drain valve blue and red air lines.

If there is air pressure, replace water tank drain valve (WP 0170).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Put WATER TANK DRAIN switch to CLOSED position (WP 0004). Connect air lines at water tank drain valve. Disconnect pump house wire harness water tank drain control valve connector. Put pump operator's panel WATER TANK DRAIN switch to OPEN position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4053 (brown) at water tank drain control valve connector, terminal 1 and a known good ground.

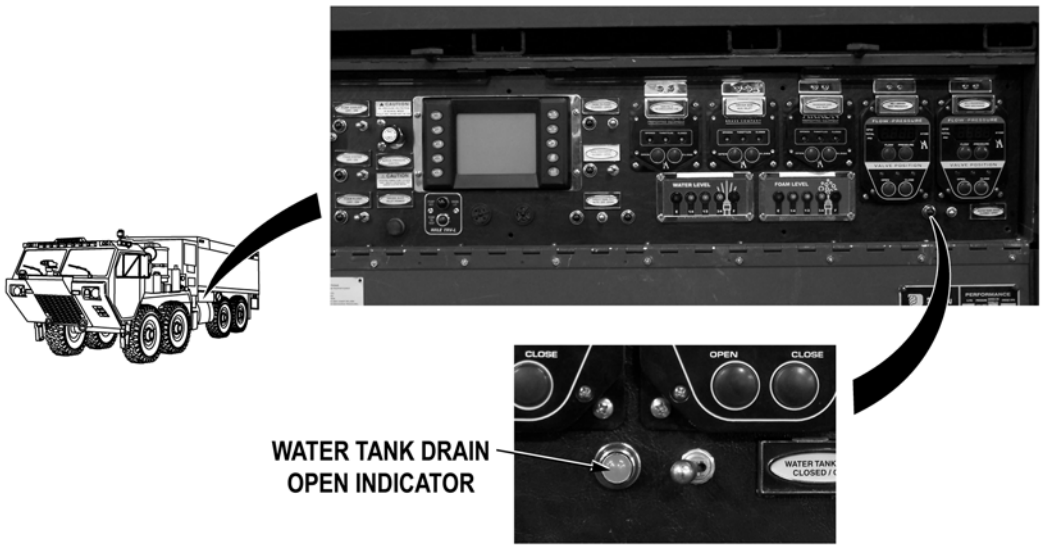
If 22 to 28 VDC are not present, go to Step 6.

Step 5. Put WATER TANK DRAIN switch to CLOSED position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2200 (black) from pump house wire harness water tank drain control valve connector, terminal 2 to a known good ground.

a. If there is continuity, replace water tank drain control valve (WP 0270).

b. If there is no continuity, repair wire 2200 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Check if pump operator's panel WATER TANK DRAIN open indicator is illuminated (WP 0004).

If indicator is not illuminated, go to Step 9.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

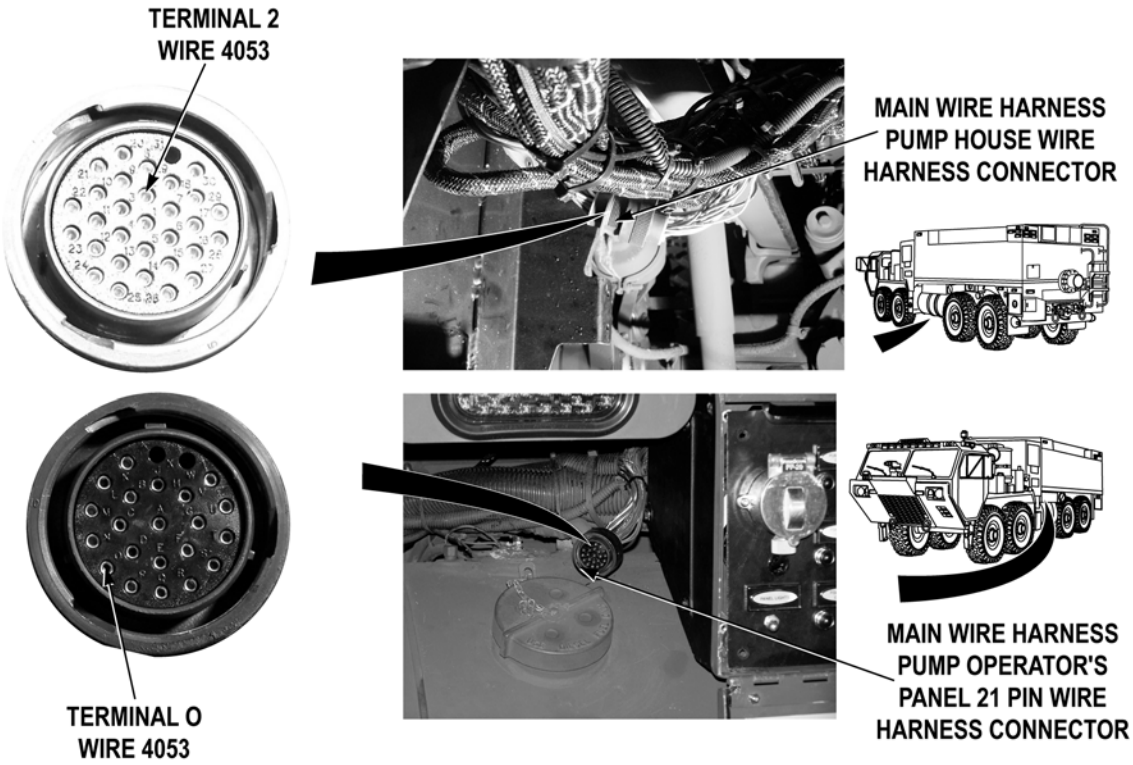
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 7. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 4053 (brown) at main wire harness pump house wire harness connector, terminal 2 and a known good ground.

If 22 to 28 VDC are present, repair wire 4053 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

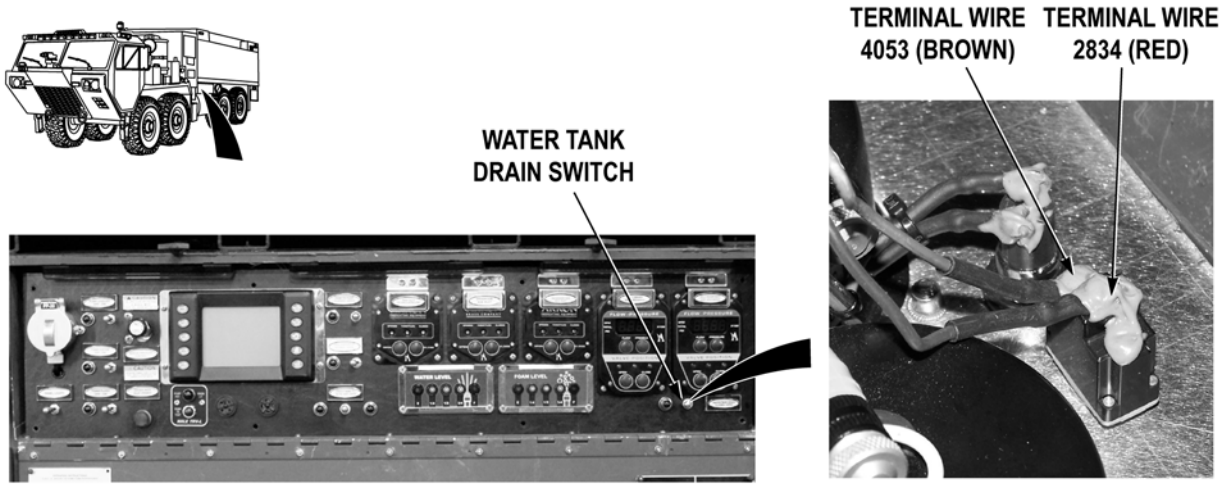


Step 8. Put pump operator's panel WATER TANK DRAIN switch to CLOSED position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for continuity across main wire harness wire 4053 (brown) from main wire harness pump operator's panel 21 pin wire harness connector, terminal O to main wire harness pump house wire harness connector, terminal 2.

a. If there is continuity, repair wire 4053 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 4053 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 9. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Push battery disconnect switch to on position. With a test lead set, check for 22 to 28 VDC between pump operator's panel wire harness wire 2834 (red) at WATER TANK DRAIN switch terminal and a known good ground.

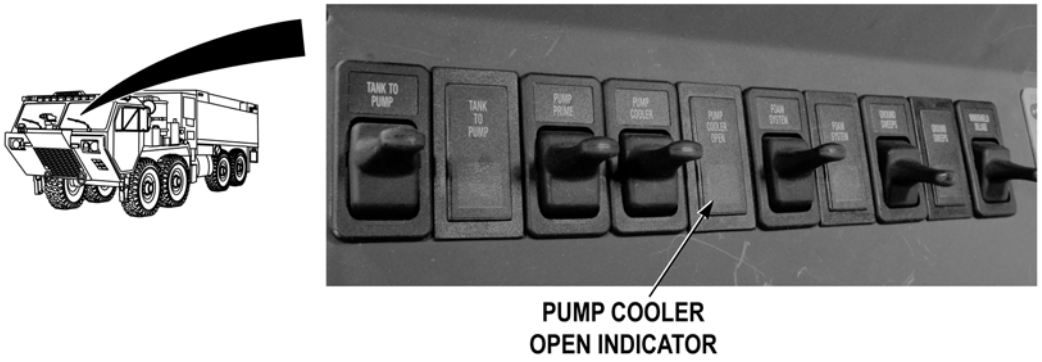
If 22 to 28 VDC are not present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 10. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across WATER TANK DRAIN switch from terminal wire 2834 (red) to terminal wire 4053 (brown), while switch is in OPEN position.

a. If there is continuity, repair wire 4053 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

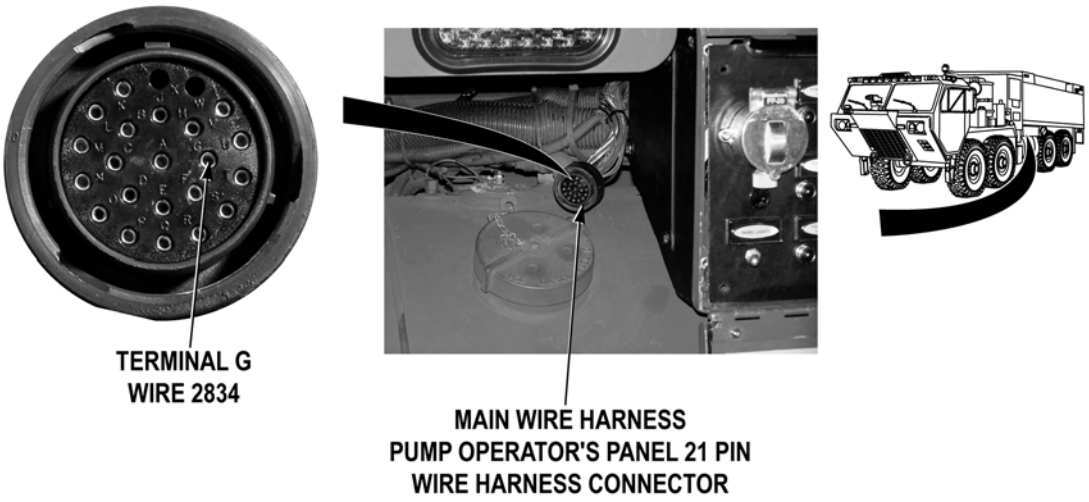
b. If there is no continuity, replace WATER TANK DRAIN switch (WP 0218).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Put pump operator's panel PUMP COOLER switch to OFF position (WP 0004) and release. Put cab PUMP COOLER switch to on position (WP 0004) and release. Check if cab PUMP COOLER OPEN indicator illuminates.

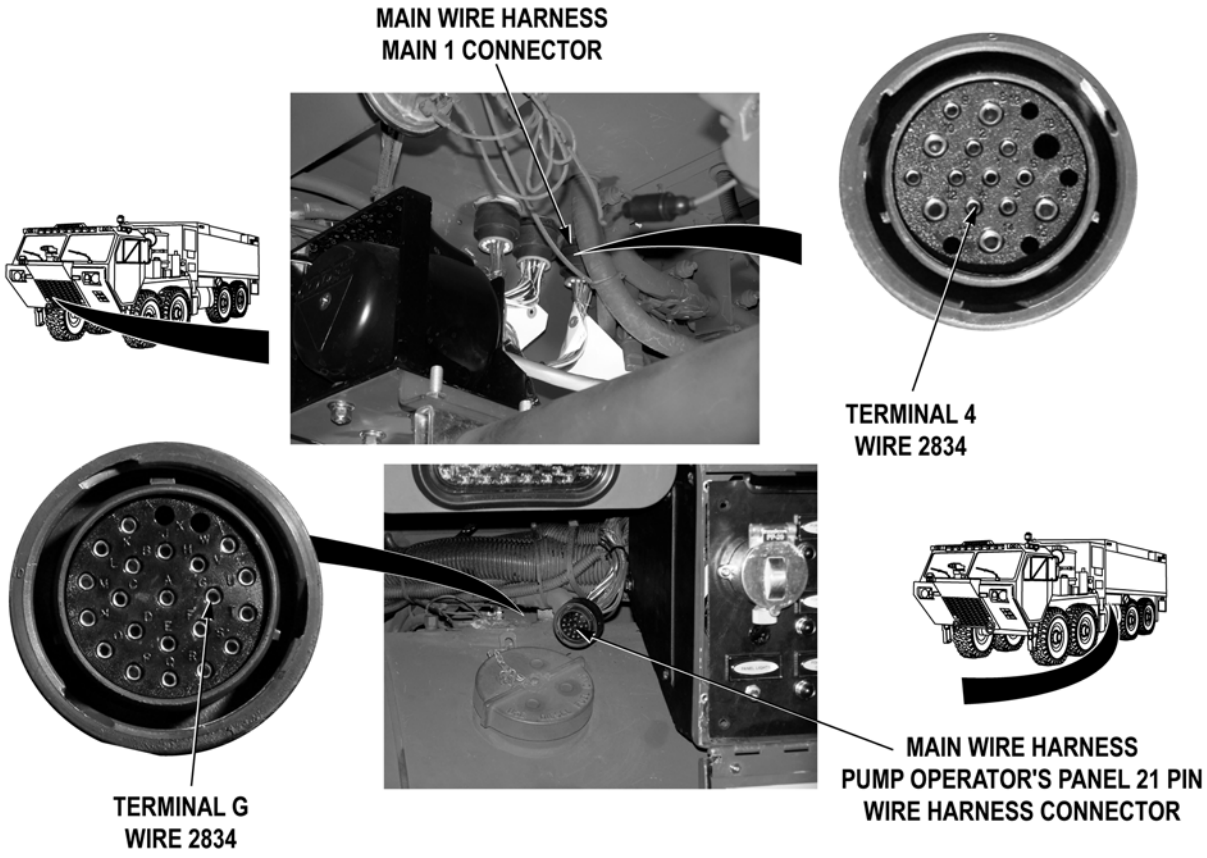
If cab PUMP COOLER OPEN indicator does not illuminate, go to Step 14.



Step 12. Put cab PUMP COOLER switch to off position (WP 0004) and release. Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2834 (red) at main wire harness pump operator's panel 21 pin wire harness connector, terminal G and a known good ground.

If 22 to 28 VDC are present, repair wire 2834 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

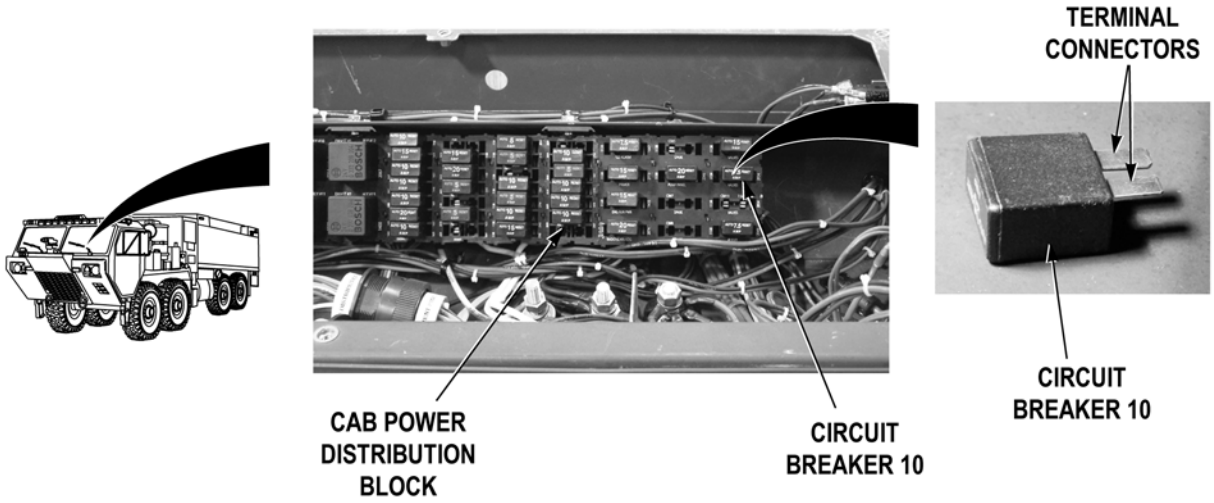
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0004). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 2834 (red) from main 1 connector, terminal 4 to main wire harness pump operator's panel 21 pin wire harness connector, terminal G.

If there is no continuity, repair wire 2834 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



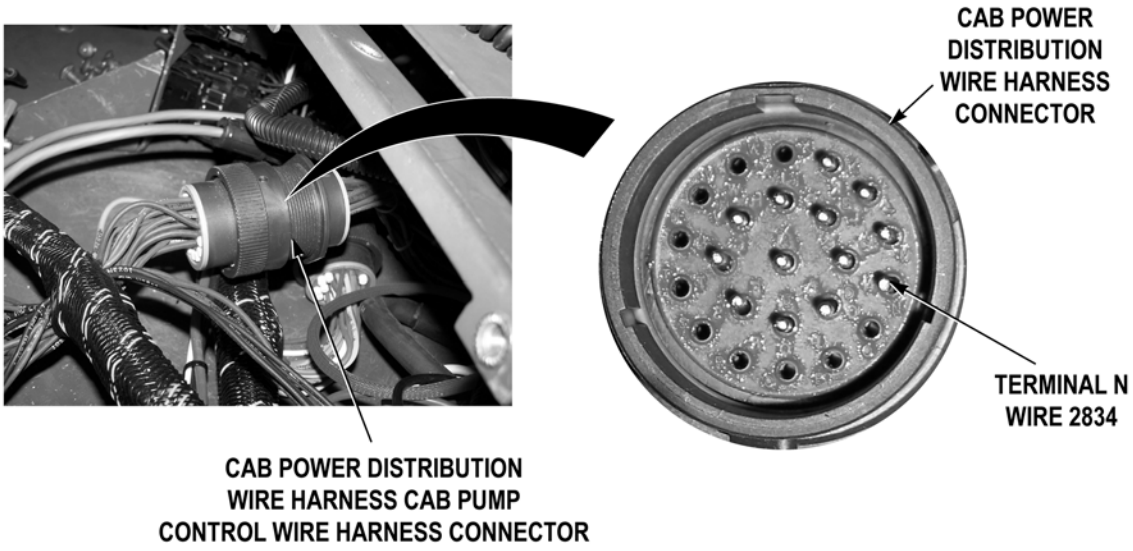
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 10 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker 10 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Disconnect cab power distribution wire harness cab pump control wire harness connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC at cab power distribution wire harness connector wire 2834 (red), terminal N and a known good ground.

a. If 22 to 28 VDC are present, repair wire 2834 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If 22 to 28 VDC are not present, repair wire 2834 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER TANK LEVEL INDICATOR GAUGE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0010
WP 0014
WP 0188
WP 0198
WP 0203

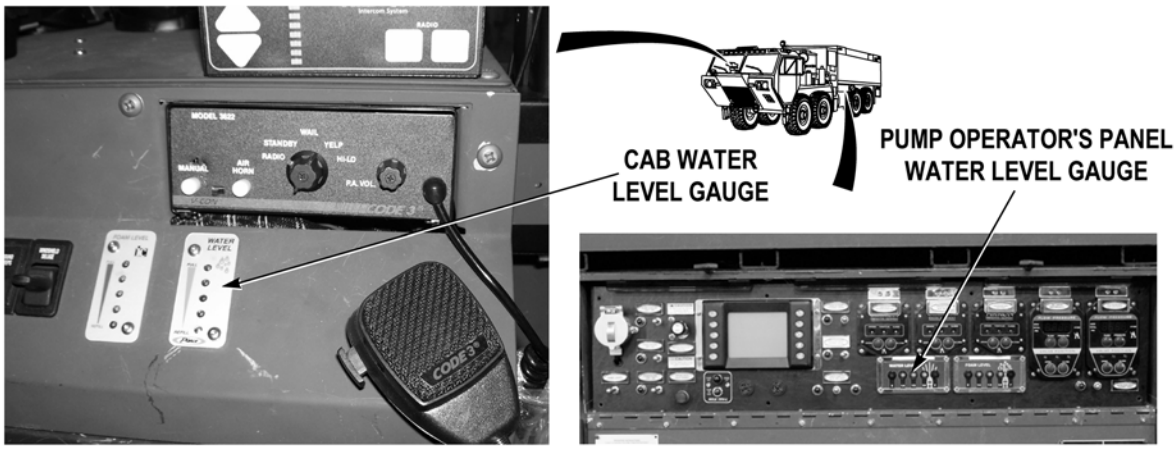
References (continued)
WP 0205
WP 0210
WP 0240
WP 0280
WP 0281
WP 0293
WP 0304
WP 0187
WP 0283

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WATER TANK LEVEL INDICATOR GAUGE DOES NOT OPERATE PROPERLY

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

- WATER LEVEL gauge indicators operate as follows: "E" indicator will flash when water level in tank is below 1/4 full. "E" and "1/4" indicators will illuminate when water tank is 1/4 full. "E", "1/4" and "1/2" indicators will illuminate when water tank is 1/2 full. "E", "1/4", "1/2", and "3/4" indicators will illuminate when water tank is 3/4 full. All indicators will illuminate when water tank is full.
- WATER LEVEL gauge "E" indicator will illuminate or flash whenever power is applied to gauge.

Step 1. Push battery disconnect switch to on position (WP 0007). Open pump operator's panel cover (WP 0010). Check if cab and pump operator's panel WATER LEVEL gauge indicators illuminate or flash (WP 0004).

If cab and pump operator's panel WATER LEVEL gauge indicators do not illuminate or flash, go to Step 10.

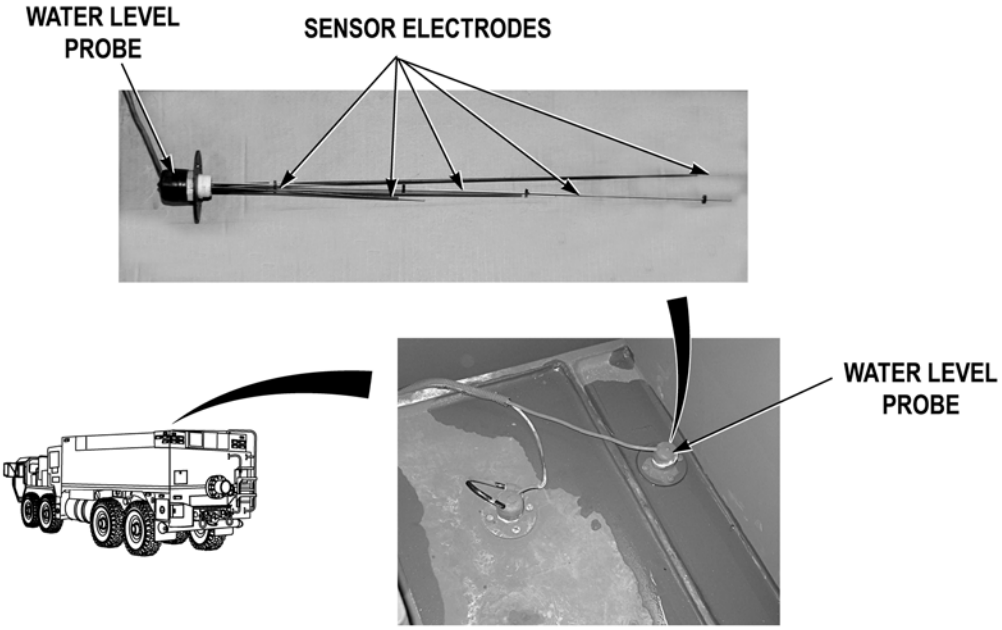
Step 2. Check if only pump operator's panel WATER LEVEL gauge indicators illuminate or flash (WP 0004).

If cab WATER LEVEL gauge indicators do not illuminate or flash, go to Step 8.

Step 3. With water tank filled (WP 0014), check if cab and pump operator's panel WATER LEVEL gauge readings are equal (WP 0004).

If cab and pump operator's panel WATER LEVEL gauge readings are not equal, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



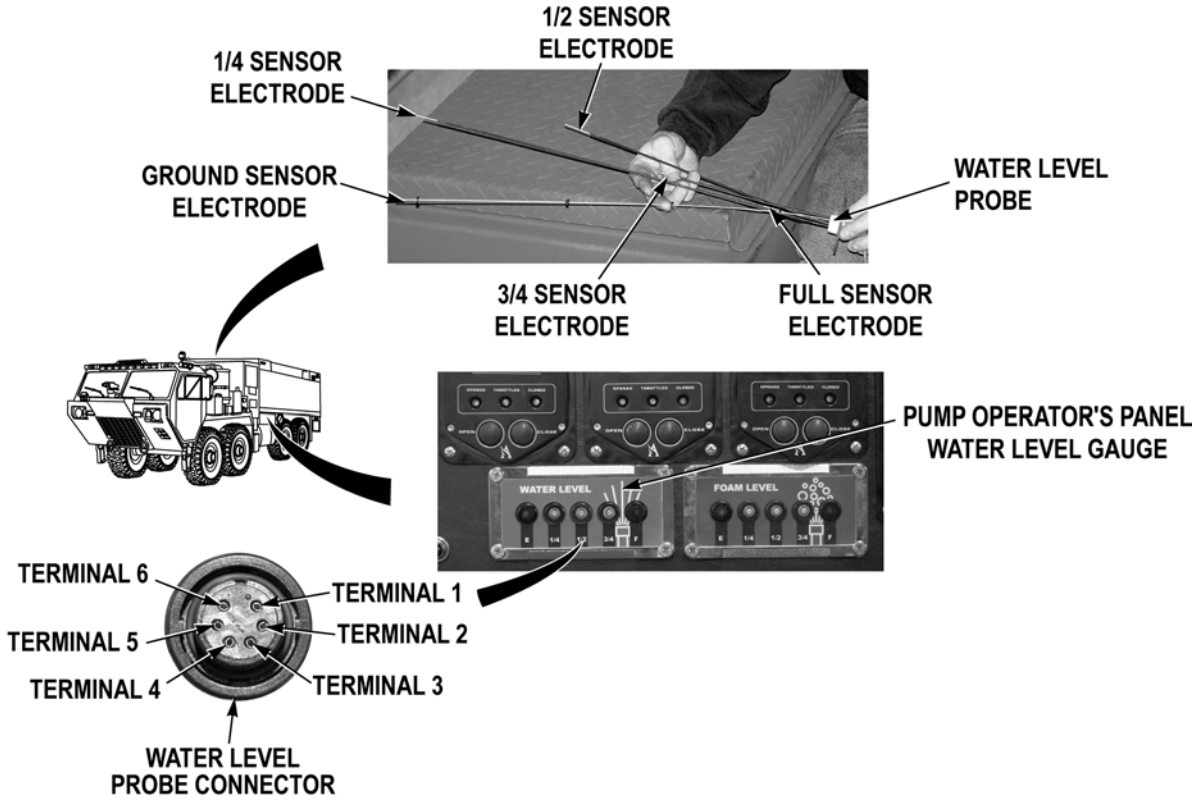
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Remove foam/water tank level probe cover (WP 0187). Remove water tank level probe (WP 0188). Remove setscrew and sensor element from tube. Check sensor electrodes for hard water deposits.

If hard water deposits have formed on sensor electrodes, clean sensor electrodes and go to

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Open pump operator's panel (WP 0205). Disconnect water tank level probe connector from water level gauge connector. With a test lead set, check for continuity across sensor electrodes as follows. Check for continuity from water level probe connector, terminal 2 to tip of 1/4 sensor electrode. Note reading. Check for continuity from water level probe connector, terminal 3 to tip of 1/2 sensor electrode. Note reading. Check for continuity from water level probe connector, terminal 4 to tip of 3/4 sensor electrode. Note reading. Check for continuity from water level probe connector, terminal 5 to tip of full sensor electrode. Note reading. Check for continuity from water level probe connector, terminal 6 to tip of ground sensor electrode. Note reading.

If there is no continuity across any sensor electrode, replace water level probe (WP 0188).

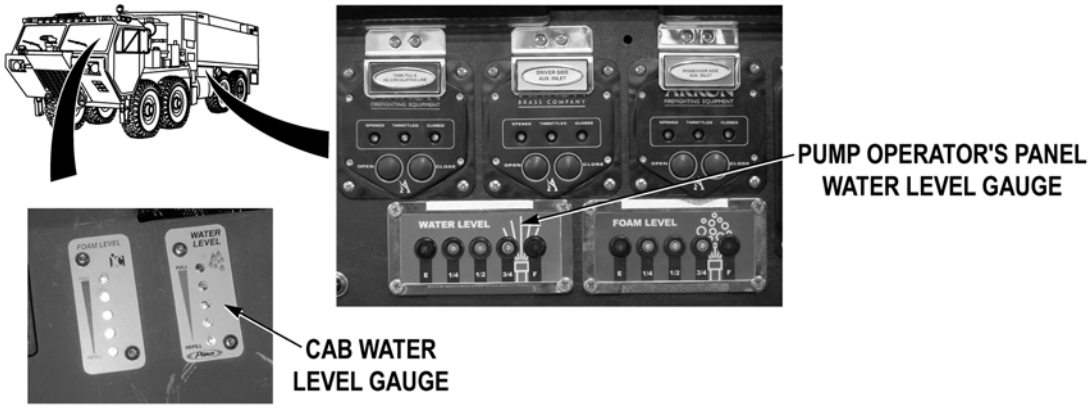
Step 5. Check for 12K to 16k ohms resistance between water level probe connector, terminals 1 and 2. Note reading. Repeat resistance checks for terminals 1 and 3, 1 and 4, and 1 and 5.

If resistance is not between 12K and 16K ohms for any sensor electrode, replace water level probe (WP 0188).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 6. Check for greater than 1M ohms resistance between water level probe connector, terminals 6 and 2. Note reading. Repeat resistance checks for terminals 6 and 3, 6 and 4, and 6 and 5.

If resistance is less than 1M ohms for any sensor electrodes, replace water level probe (WP 0188).

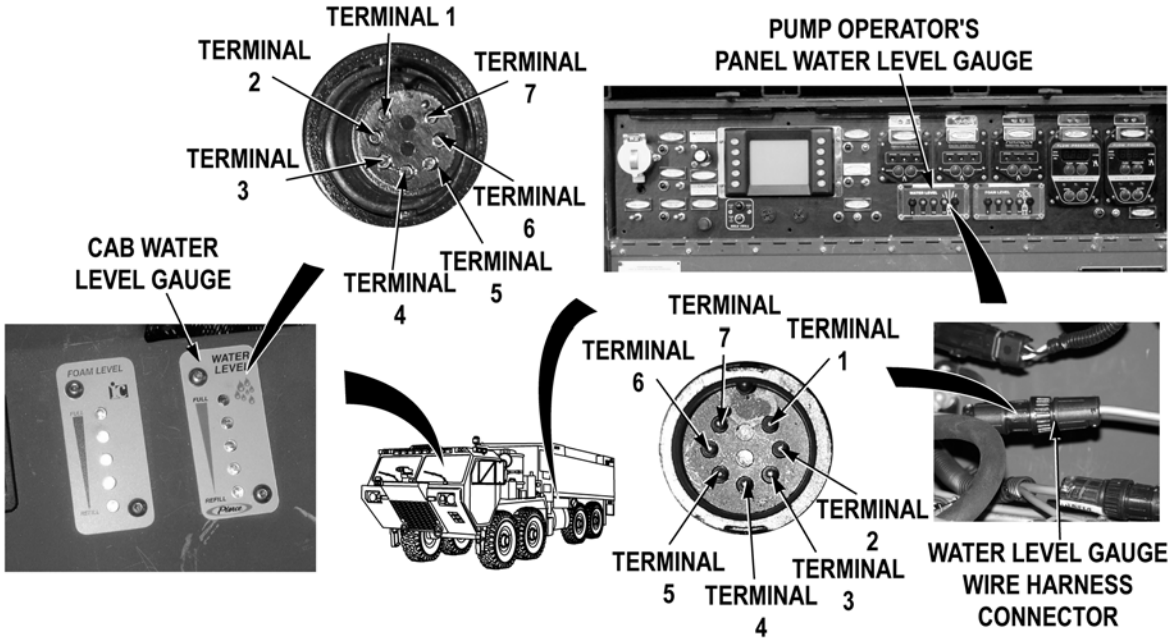


Step 7. Assemble and install water level probe (WP 0188). Connect water level probe connector to pump operator's panel water level gauge, if removed. Push battery disconnect switch to on position (WP 0007). Check if cab and pump operator's panel WATER LEVEL gauges indicate correct water level in water tank.

a. If gauges indicate correct water level in tank, fault has been corrected.

b. If gauges do not indicate correct water level in tank, replace pump operator's panel WATER LEVEL gauge (WP 0210).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 8. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect cab water level gauge wire harness connector from pump operator's panel WATER LEVEL gauge. Remove cab instrument panel B (WP 0203). Disconnect cab water level gauge wire harness connector from cab WATER LEVEL gauge. With a test lead set, check for continuity across cab water level gauge wire harness from pump operator's panel WATER LEVEL gauge connector, terminals 1 to cab WATER LEVEL gauge connector, terminal 1. Note reading. Repeat continuity checks for terminals 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, and 7 to 7.

If there is no continuity for any pair of terminals, replace cab water tank level gauge wire harness (WP 0283).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 9. Connect cab water level gauge wire harness connector to cab WATER LEVEL gauge. Disconnect auto fill control wire harness connector from pump operator's panel WATER LEVEL gauge. Connect cab water level gauge wire harness connector to pump operator's panel WATER LEVEL gauge auto fill wire harness connector. Push battery disconnect switch to on position (WP 0007). Check if cab WATER LEVEL gauge indicates correct water level in water tank.

a. If cab WATER LEVEL gauge indicates correct water level in tank, replace pump operator's panel WATER LEVEL gauge (WP 0210).

b. If cab WATER LEVEL gauge does not indicates correct water level in tank, replace cab WATER LEVEL gauge (WP 0198).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

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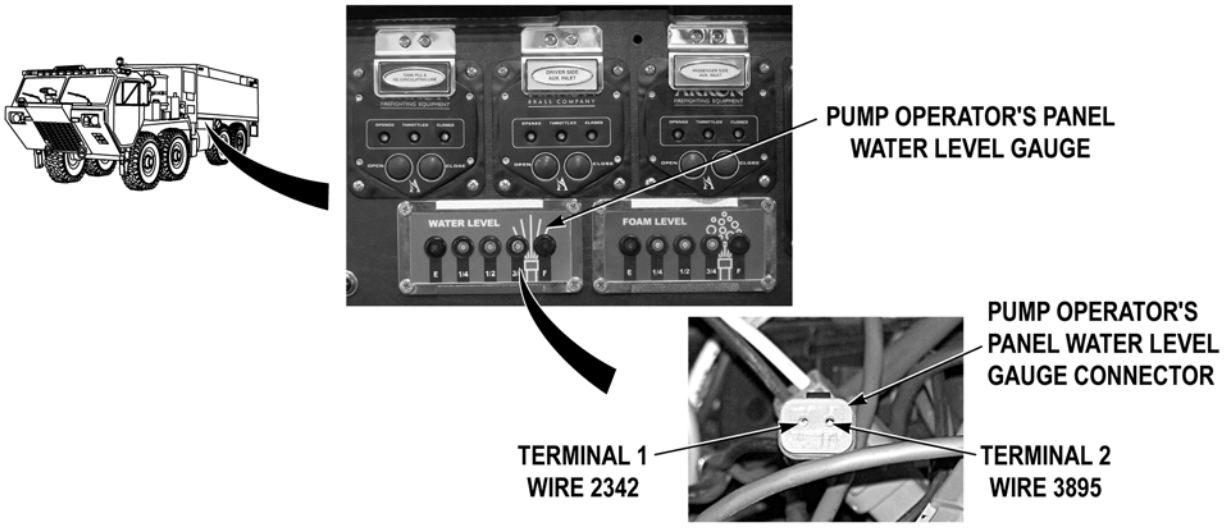
Step 10. Check if pump operator's panel FOAM LEVEL gauge indicators illuminate or flash.

If pump operator's panel FOAM LEVEL gauge indicators do not illuminate or flash, go to Step 13.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness WATER LEVEL gauge connector. With a test lead set, check for 22 to 28 VDC between wire 2342 (red) at pump operator's panel wire harness WATER LEVEL gauge connector, terminal 1 and a known good ground.

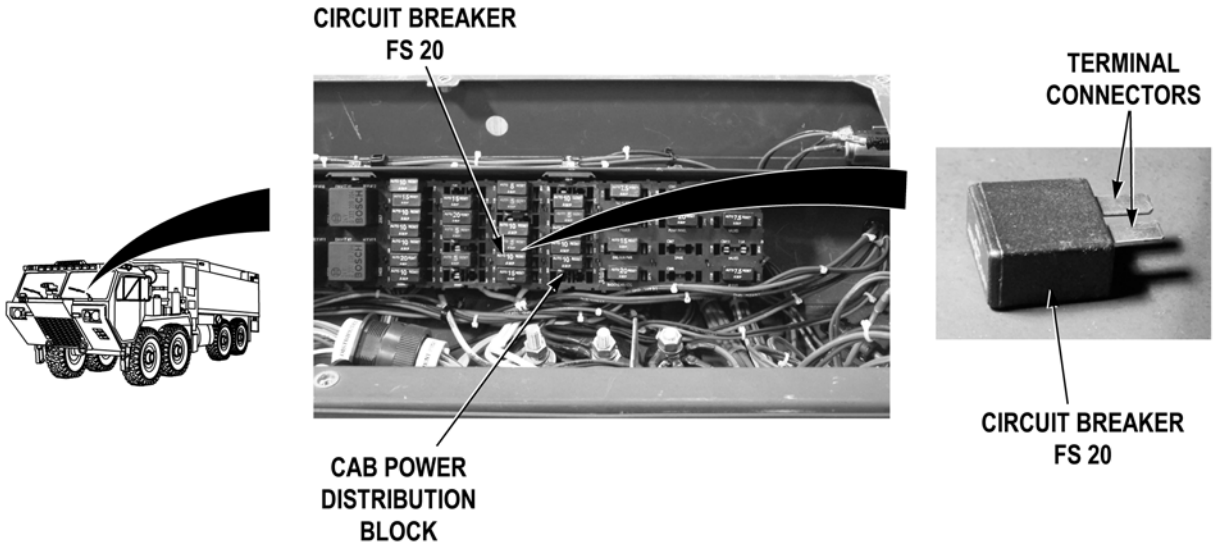
If 22 to 28 VDC are not present, repair wire 2342 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 12. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump operator's panel wire harness wire 3895 from WATER LEVEL gauge connector, terminal 2 to a known good ground.

a. If there is continuity, replace pump operator's panel WATER LEVEL gauge (WP 0210).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



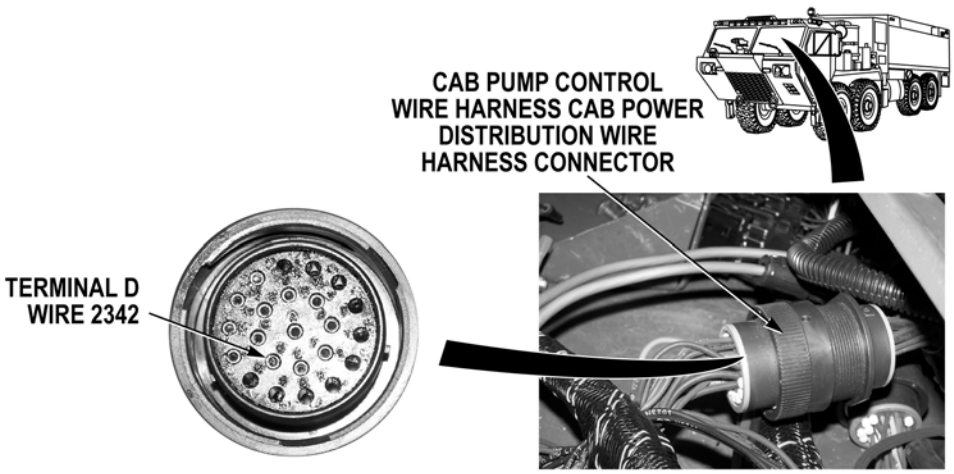
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 13. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 20 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 20 (WP 0240).

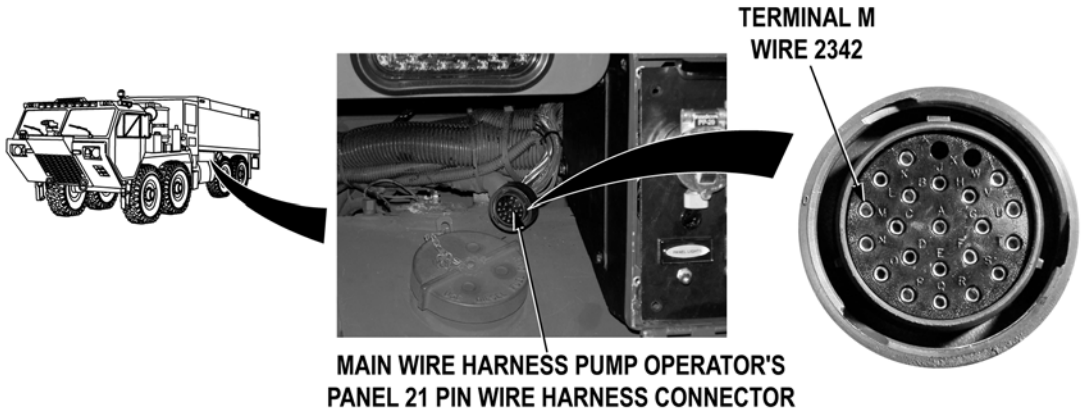
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Install circuit breaker FS 20 (WP 0240). Disconnect cab pump control wire harness cab power distribution wire harness connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 2342 (red) at cab pump control wire harness cab power distribution wire harness connector, terminal D and a known good ground.

If 22 to 28 VDC are not present, repair wire 2342 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

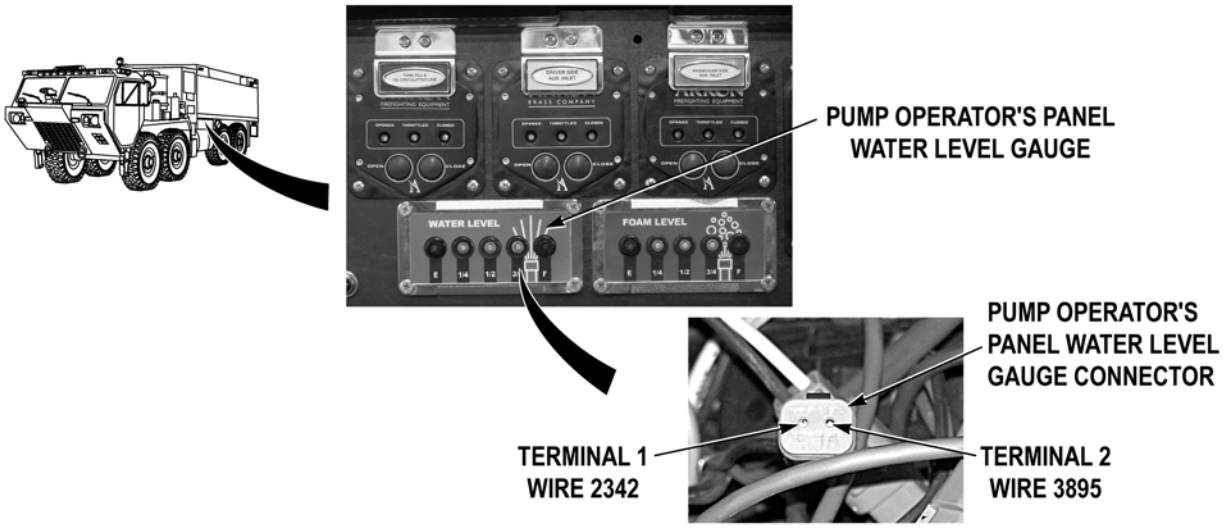
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Connect cab pump control wire harness cab power distribution wire harness connector. Disconnect main wire harness pump operator’s panel 21 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2342 (red) at main wire harness pump operator’s panel 21 pin wire harness connector, terminal M and a known good ground.

If 22 to 28 VDC are not present, go to Step 17.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

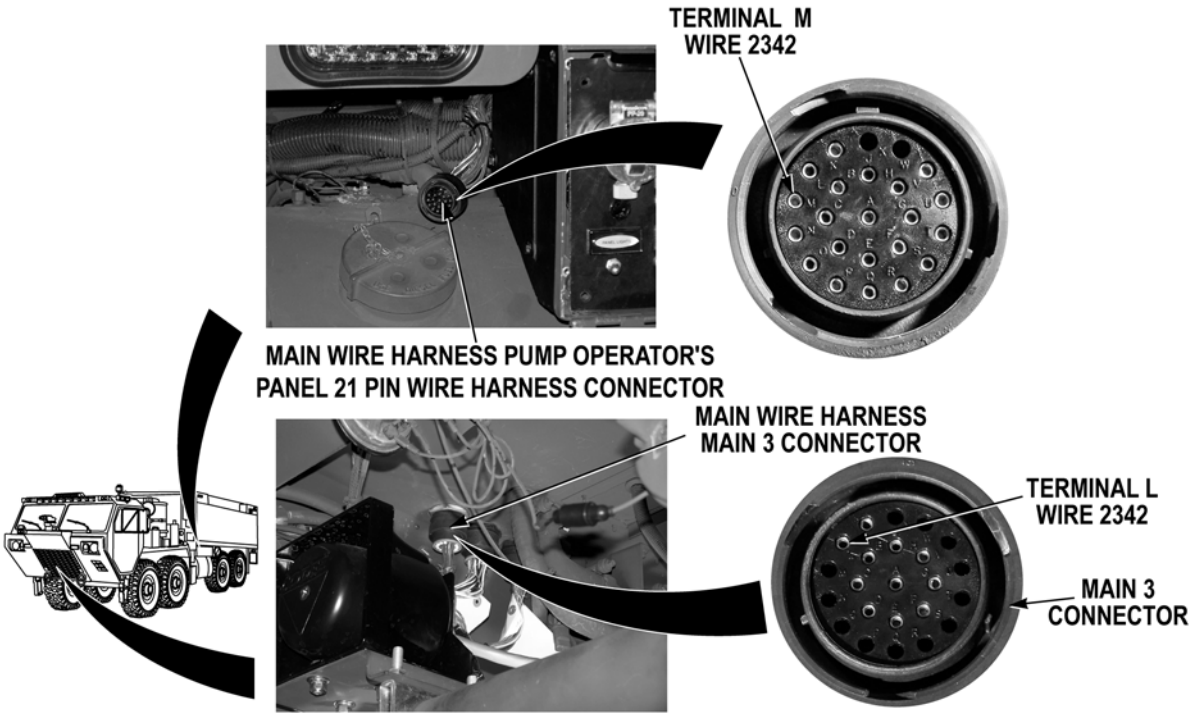


Step 16. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness WATER LEVEL gauge connector. With a test lead set, check for continuity across pump operator's panel wire harness wire 3895 (black) from WATER LEVEL gauge connector, terminal 2 to a known good ground.

a. If there is continuity, repair wire 2342 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2342 (red) from main 3 connector, terminal L to main wire harness pump operator's panel 21 pin wire harness connector, terminal M.

a. If there is continuity, repair wire 2342 in cab pump control harness if repairable (TM 9-2320-315-14&P), or replace cab pump control harness (WP 0281).

b. If there is no continuity, repair wire 2342 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER PUMP INPUT PRESSURE LOW OR PRESSURE GOVERNOR DISPLAYS CAVITATION, LOW SUPPLY PRESSURE, AND PUMP RETURNS TO IDLE MODE

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

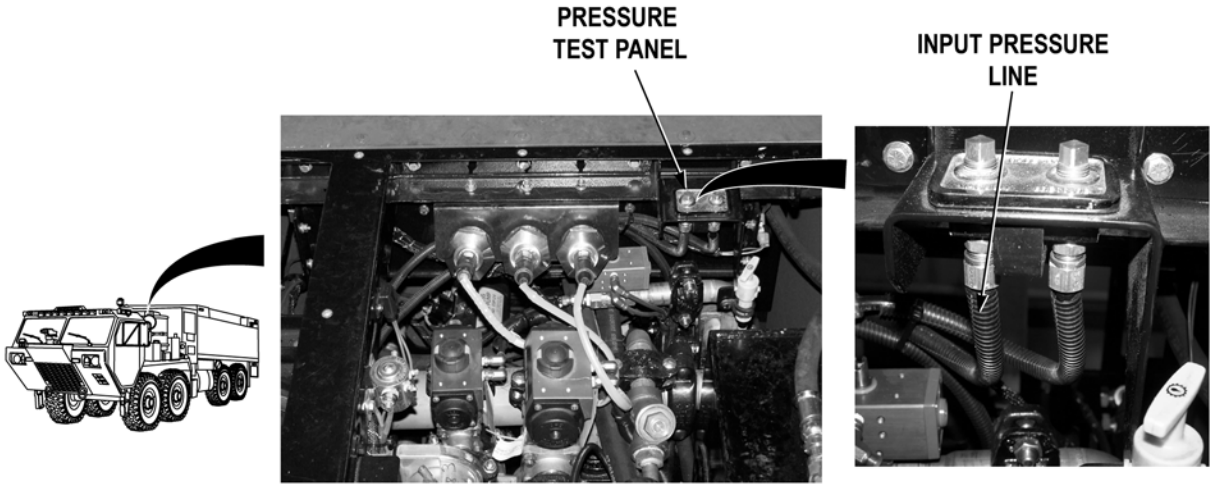
References
WP 0004
WP 0007
WP 0014
WP 0016

References (continued)
WP 0074
WP 0264
WP 0322
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

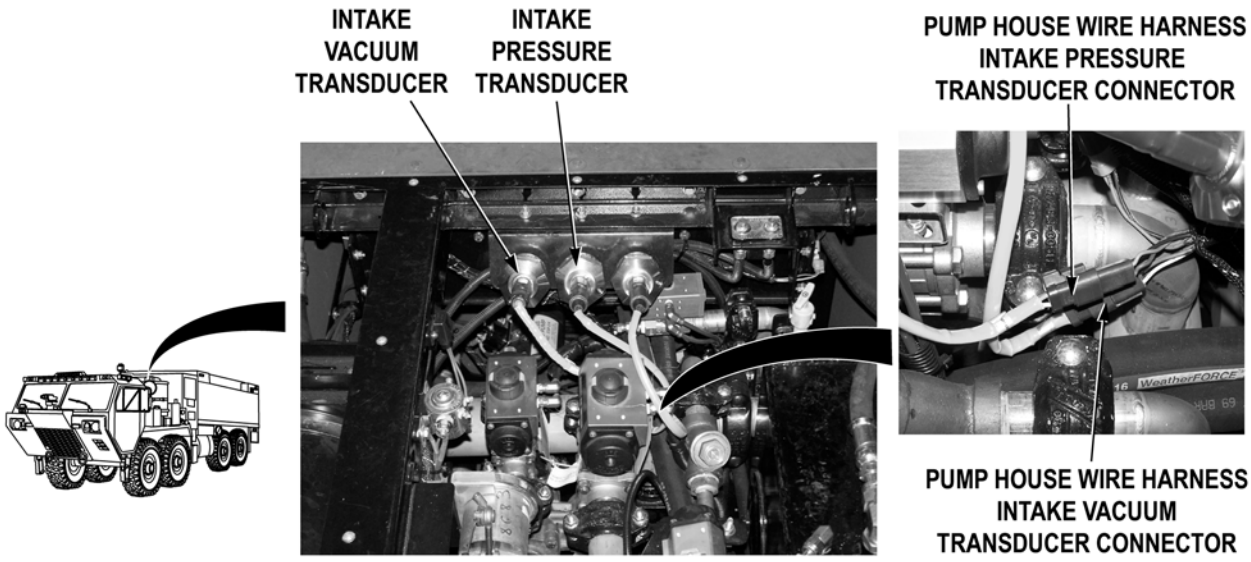
WATER PUMP INPUT PRESSURE LOW OR PRESSURE GOVERNOR DISPLAYS CAVITATION, LOW SUPPLY PRESSURE, AND PUMP RETURNS TO IDLE MODE



Step 1. Remove pump house panel K (WP 0341). Check pump input pressure line from pressure test panel to water pump for kinks and damage.

If pump input pressure line is kinked or damaged, replace input pressure line (WP 0322).

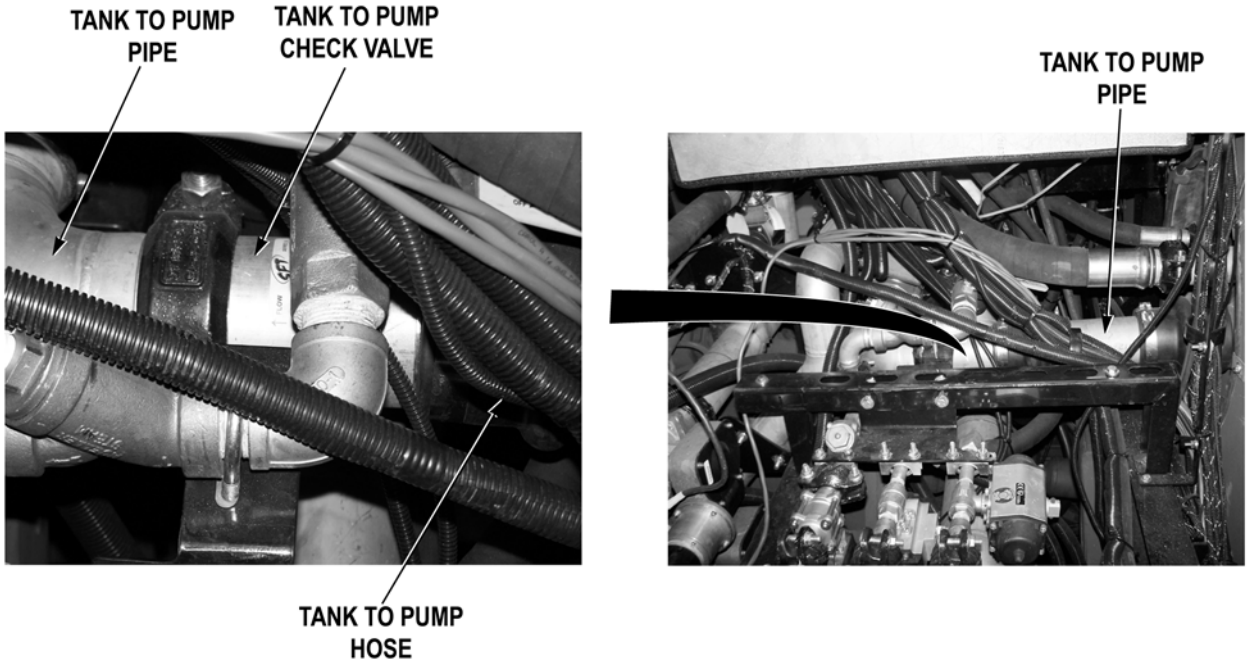
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Check intake pressure transducer and intake vacuum transducer wire harnesses for damage and loose connections.

If intake pressure transducer or intake vacuum transducer wire harnesses have loose connections or are damaged, reconnect loose connectors or replace damaged pump house wire harness (WP 0303).

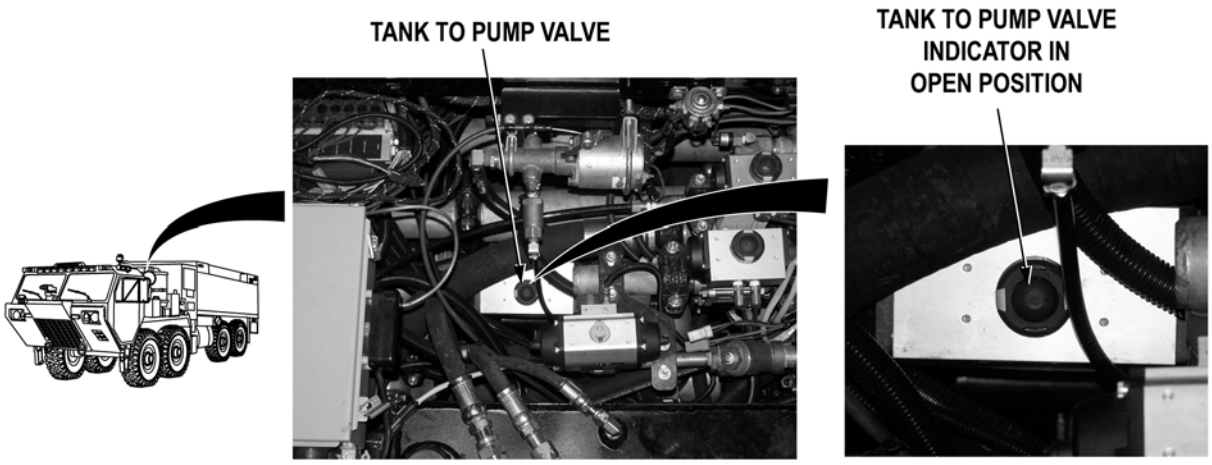
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Check pipes, hoses, and fittings from tank to pump for leaks and damage.

If pipes, hoses, and fittings are not free from leaks and damage, drain water tank (WP 0014) and replace damaged pipes, hoses, and fittings (WP 0322).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



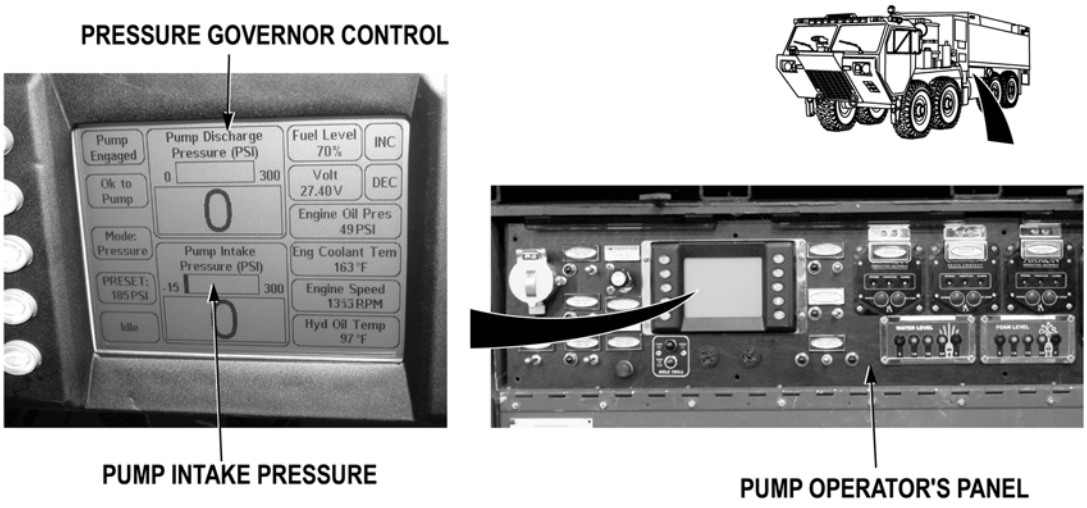
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation.

Step 4. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). While an assistant puts cab or pump operator's panel TANK TO PUMP switch to OPEN position (WP 0004), check if tank-to-pump valve operates.

If tank to pump valve does not operate, troubleshoot Tank-To-Pump Valve Does Not Operate Properly (WP 0074).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. If empty, fill water tank (WP 0014). Start engine (TM 9-2320-279-10). Put pump PTO switch to on position (WP 0004). Put HIGH IDLE switch to on position (WP 0004). Put cab or pump operator's panel TANK TO PUMP switch to OPEN position (WP 0004). Enable cab or pump operator's panel pressure governor control (WP 0016). Check if cab or pump operator's panel pressure governor control displays a pump input pressure reading (WP 0016).

a. If pressure governor control does not display an input pressure reading and CAUTION! and WARNING! indicator is not displayed, replace input pressure transducer (WP 0264).

b. If pressure governor control does not display an input pressure reading and CAUTION! or WARNING! indicator is displayed, troubleshoot Pressure Governor Controls Do Not Operate Properly (WP 0071).

c. If pressure governor control displays a nominal input pressure reading, fault corrected.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER PUMP IS OVERHEATING

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(WP 0399, Item 17)

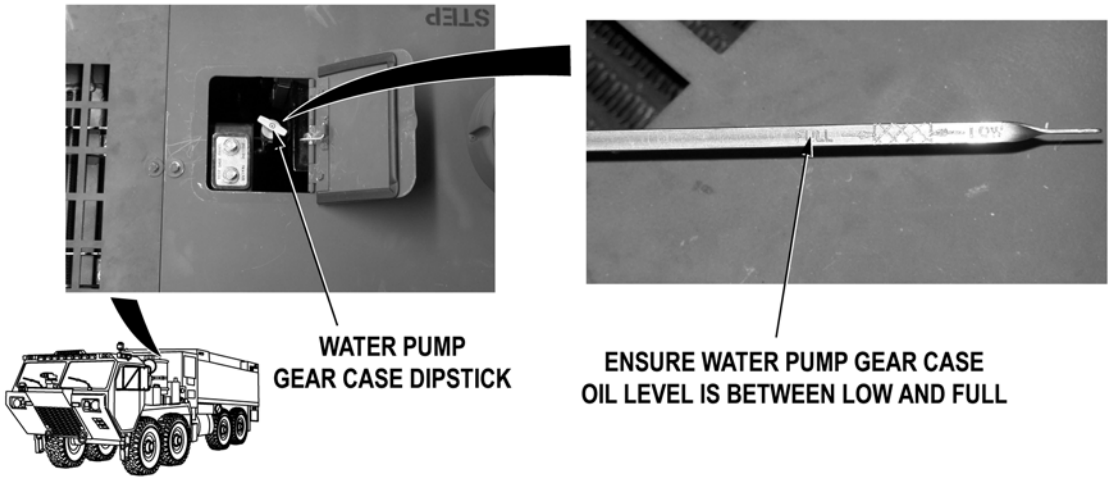
References
WP 0004
WP 0014
WP 0016
WP 0018
WP 0126
WP 0156

References (continued)
WP 0161
WP 0274
WP 0322
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WATER PUMP IS OVERHEATING



Step 1. Open pump house panel K access door. Check water pump gear case oil level (WP 0126).

If oil level is low, fill to correct level (WP 0126) and go to Step 2.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

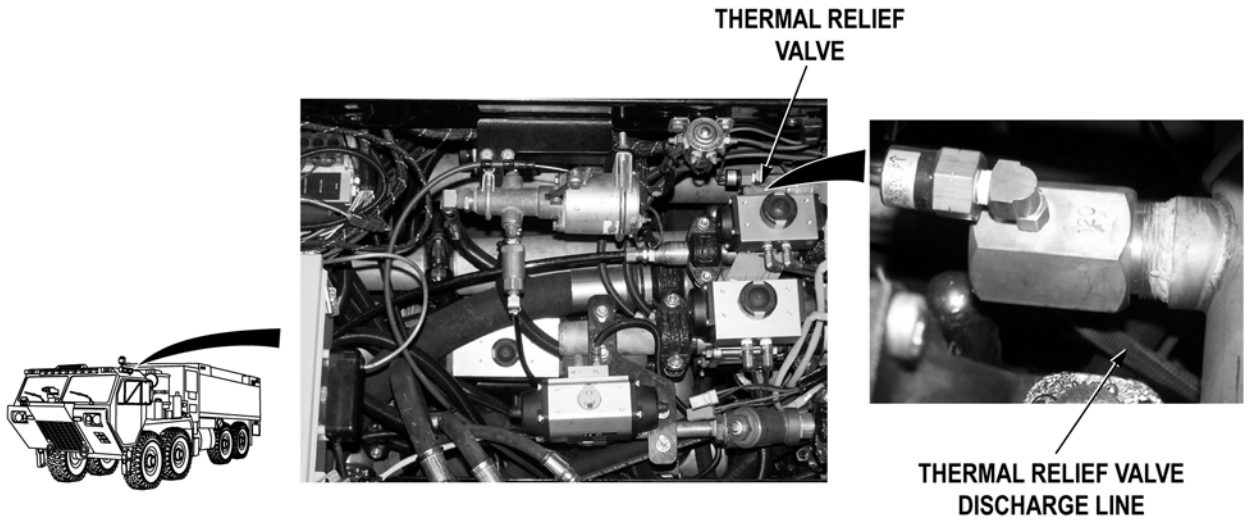
⚠ CAUTION

Pump must be primed when operating water pump. Failure to prime pump before operating water pump may cause damage to equipment.

Step 2. Start engine (TM 9-2320-279-10). Put pump PTO switch to on position (WP 0004). Put HIGH IDLE switch to on position (WP 0004). Enable pump operator's panel pressure governor control (WP 0016). Prepare system to pump from onboard water tank (WP 0018). Push pump operator's panel TANK FILL & RE-CIRCULATING LINE valve control OPEN button (WP 0004). Operate system until pump reaches operating temperature. Check if pump operator's panel PUMP HOT indicator illuminates (WP 0004).

If PUMP HOT indicator does not illuminate, fault has been corrected. Notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



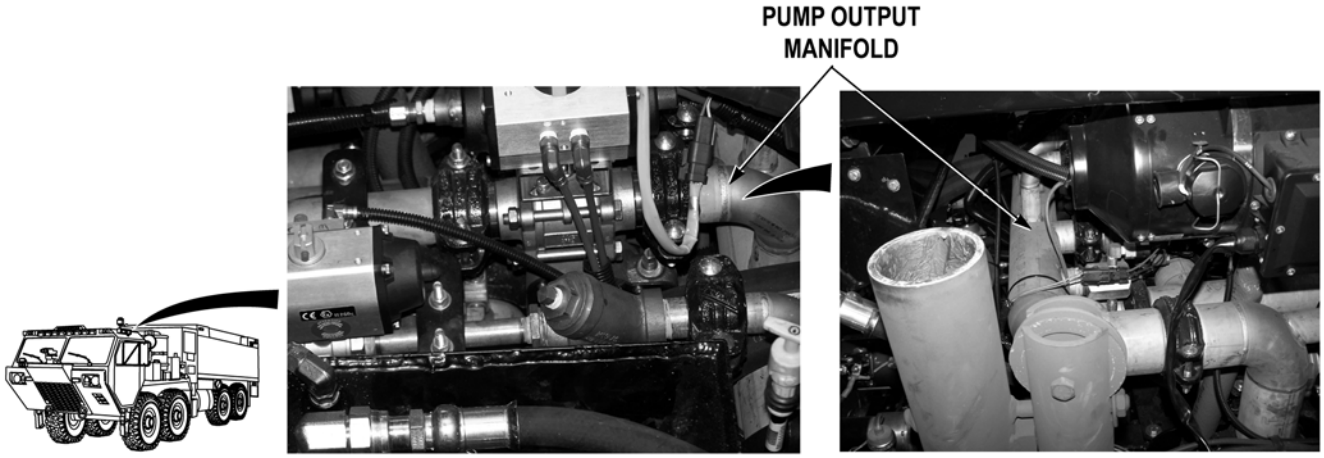
NOTE

Thermal relief valve operation is checked by checking if water is being discharged from thermal relief valve discharge line.

Step 3. While pump is at operating temperature, check if thermal relief valve is discharging water.

If thermal relief valve is not discharging water, replace thermal relief valve (WP 0161).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Pump output manifold may be hot. Use caution when checking temperature of pump output manifold, when PUMP HOT indicator is illuminated. Place hand near pump output manifold to check temperature, but do not touch hot pump output manifold. Failure to comply may cause serious burns to personnel.

Step 4. Remove pump house panel G (WP 0341). Check if pump output manifold is hot.

If pump output manifold is not hot, replace thermal relief sensor (WP 0274).

Step 5. Return pump to idle mode (WP 0016). Shut off engine (TM 9-2320-279-10). Drain water tank (WP 0014). Remove pump output manifold (WP 0322). Check pump output manifold for blockage.

a. If pump output manifold is blocked, remove blockage and re-install manifold (WP 0322).

b. If there is no blockage, replace water pump (WP 0156).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER PUMP OUTPUT PRESSURE LOW OR PRESSURE GOVERNOR DISPLAYS PRESET NOT MET, AND PUMP RETURNS TO IDLE MODE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References

WP 0004
WP 0007
WP 0014
WP 0016
WP 0018
WP 0071

References (continued)

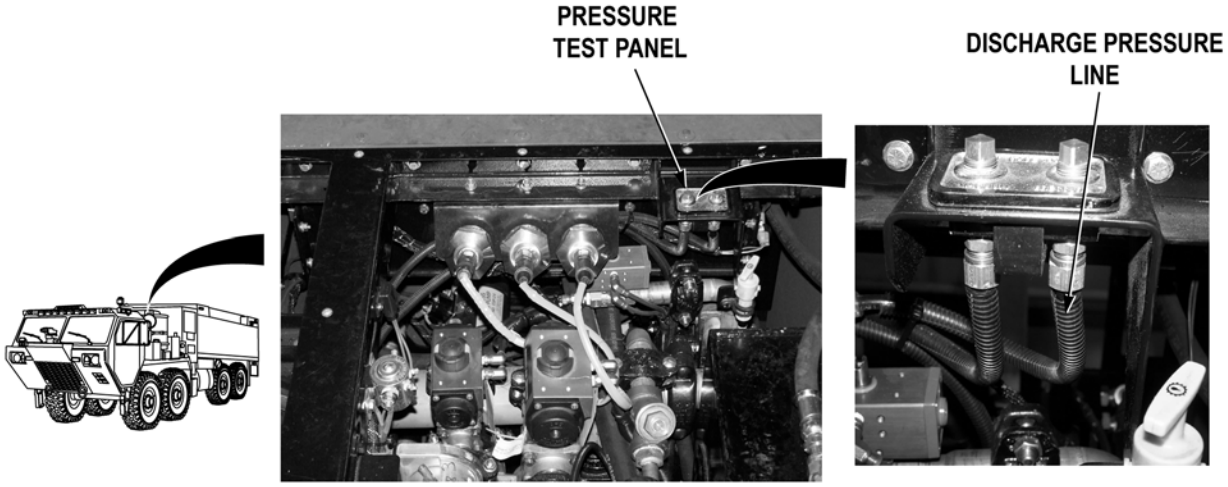
WP 0074
WP 0156
WP 0264
WP 0303
WP 0322
WP 0341

Equipment Conditions

Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

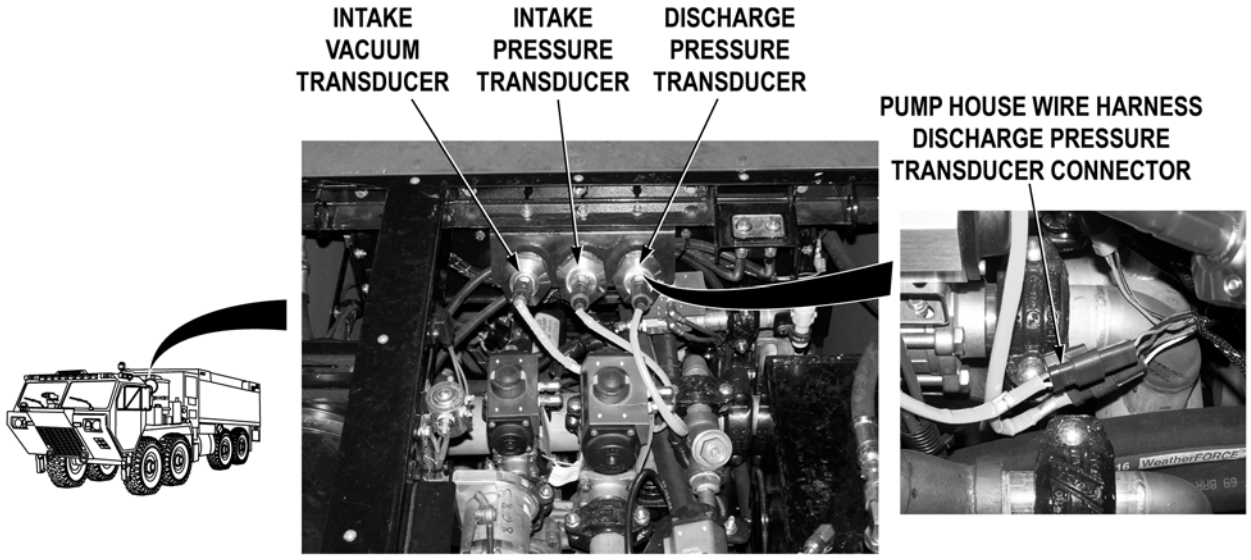
WATER PUMP OUTPUT PRESSURE LOW OR PRESSURE GOVERNOR DISPLAYS PRESET NOT MET, AND PUMP RETURNS TO IDLE MODE



Step 1. Remove pump house panel K (WP 0341). Check discharge pressure line from pressure test panel to water pump for kinks and damage.

If discharge pressure line is kinked or damaged, replace discharge pressure line (WP 0322).

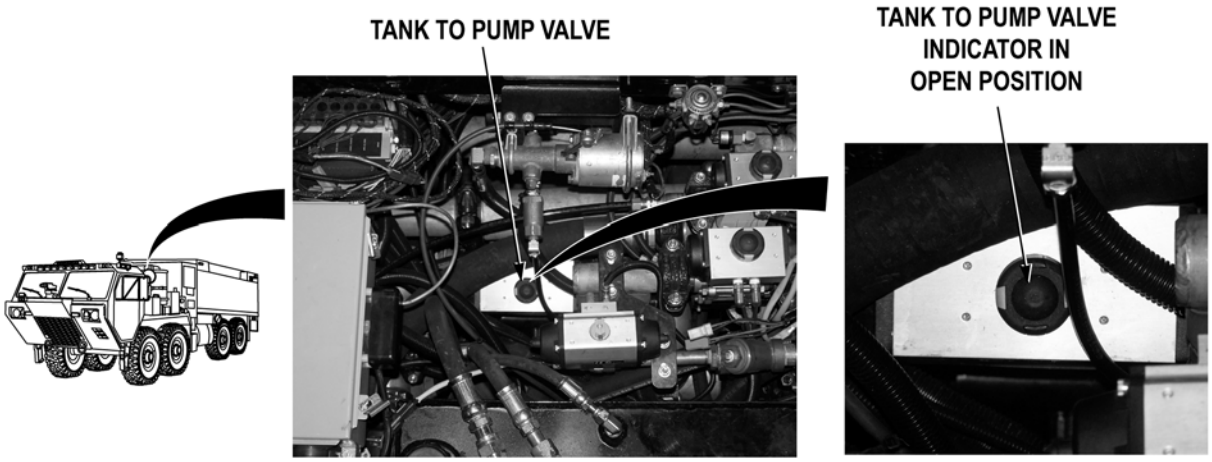
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Check pump house wire harness discharge pressure transducer connector for damage and loose connections.

Reconnect loose connectors or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



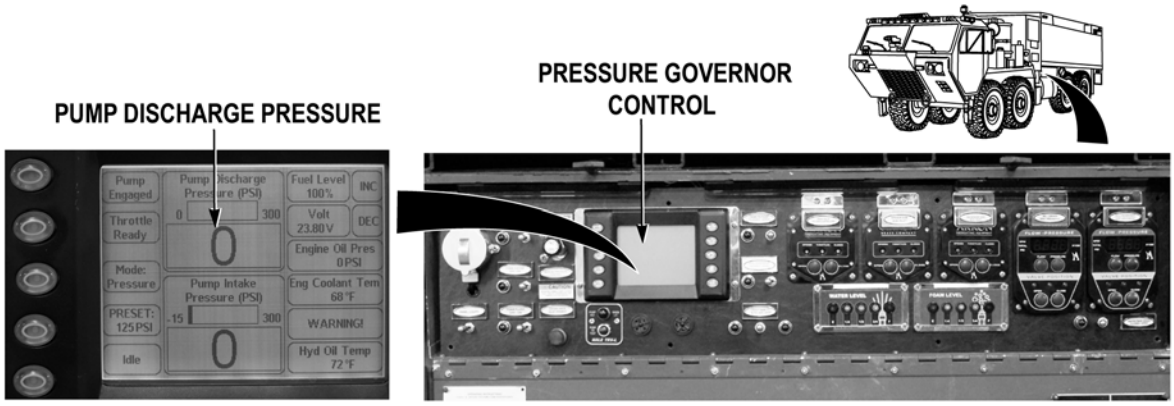
NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure, except when performing complete system checks. Valve operations can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.

Step 3. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). While an assistant puts cab or pump operator's panel TANK TO PUMP switch to open position (WP 0004), check if tank to pump valve operates.

If tank to pump valve does not operate, troubleshoot Tank-To-Pump Valve Does Not Operate Properly (WP 0074).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



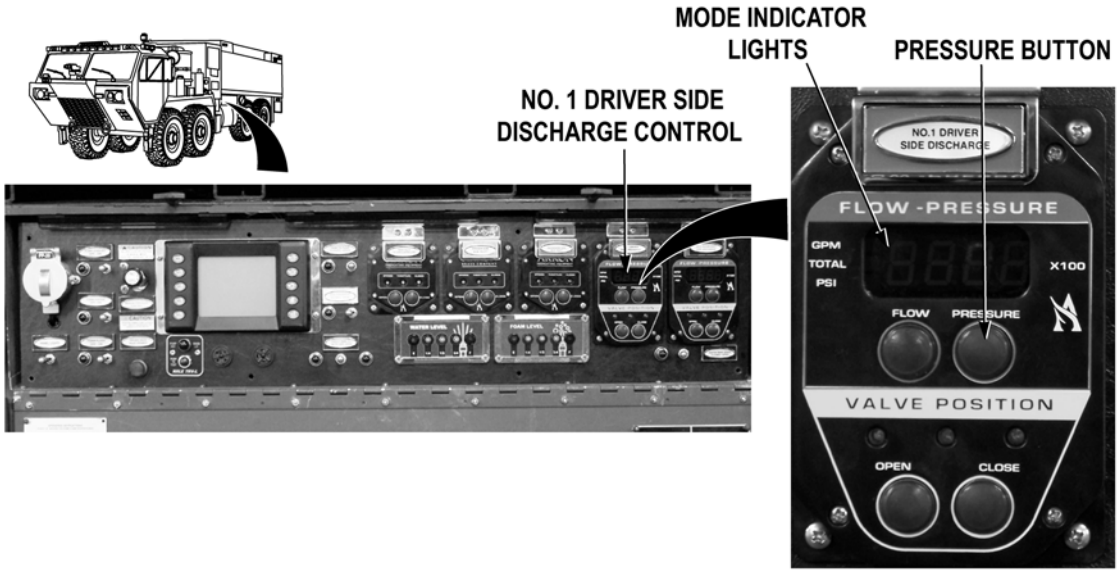
Step 4. If empty, fill water tank (WP 0014). Operate system from water tank in manual mode (WP 0018). Check if pressure governor control displays a pump discharge pressure reading (WP 0016).

a. If pressure governor control does not display a pump discharge pressure reading and CAUTION! and WARNING! indicator is not displayed, go to Step 5.

b. If pressure governor control does not display a pump discharge pressure reading and CAUTION! or WARNING! indicator is displayed, troubleshoot Pressure Governor Controls Do Not Operate Properly (WP 0071).

c. If pressure governor control displays a pump discharge pressure reading, fault corrected.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Connect hose and nozzle to NO. 1 DRIVER SIDE DISCHARGE (WP 0018). Do not open nozzle. Push NO. 1 DRIVER SIDE DISCHARGE valve control OPEN button (WP 0004). Push PRESSURE button on NO. 1 DRIVER SIDE DISCHARGE valve control (WP 0004). Check if NO. 1 DRIVER SIDE DISCHARGE valve control displays a pump discharge pressure, when valve is opened.

a. If NO. 1 DRIVER SIDE DISCHARGE valve control does not display a pump discharge pressure, replace water pump (WP 0156).

b. If NO. 1 DRIVER SIDE DISCHARGE valve control displays a pump discharge pressure, replace pump discharge transducer (WP 0264).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

9FIELD LEVEL MAINTENANCE

WINDSHIELD DELUGE SYSTEM DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

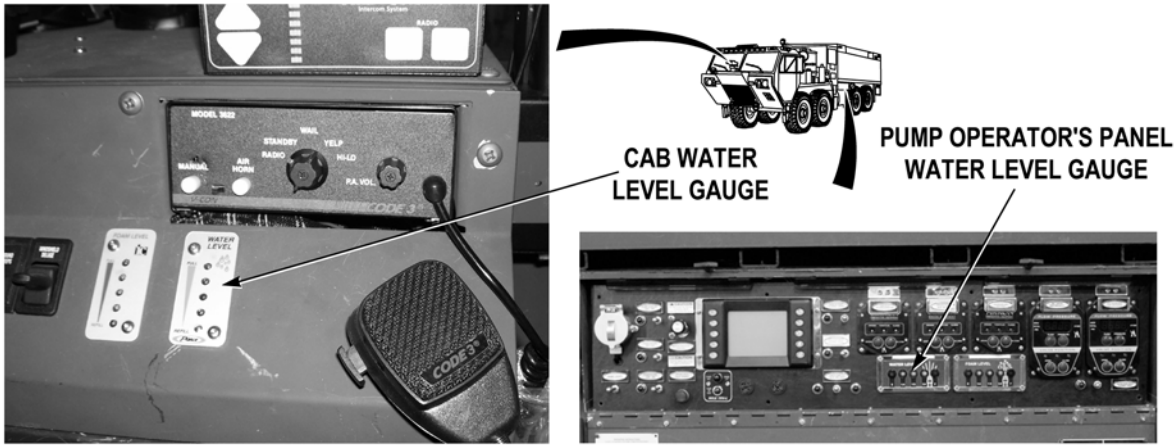
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0014
WP 0197
WP 0203
WP 0240
WP 0261
WP 0262
WP 0276

References (continued)
WP 0280
WP 0281
WP 0293
WP 0300
WP 0303
WP 0322
WP 0341
WP 0367
WP 0368
WP 0386

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

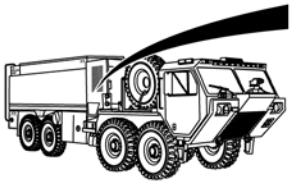
WINDSHIELD DELUGE SYSTEM DOES NOT OPERATE PROPERLY

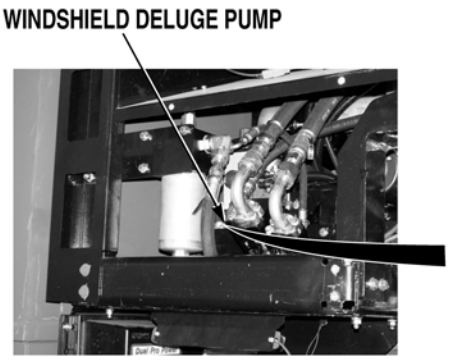


Step 1. Push battery disconnect switch to on position (WP 0007). Using cab or pump operator's panel WATER LEVEL gauge, check if there is enough water in water tank to operate windshield deluge system.

If water tank is empty, fill tank enough to operate windshield deluge system (WP 0014) and go to Step 2.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





NOTE

- Water will be expelled at windshield when operating windshield deluge system. Move vehicle to outside area or place suitable container under windshield.
- Windshield deluge pump motor operation will be checked by listening for a whining sound from pump motor when WINDSHIELD DELUGE switch is put to on position.

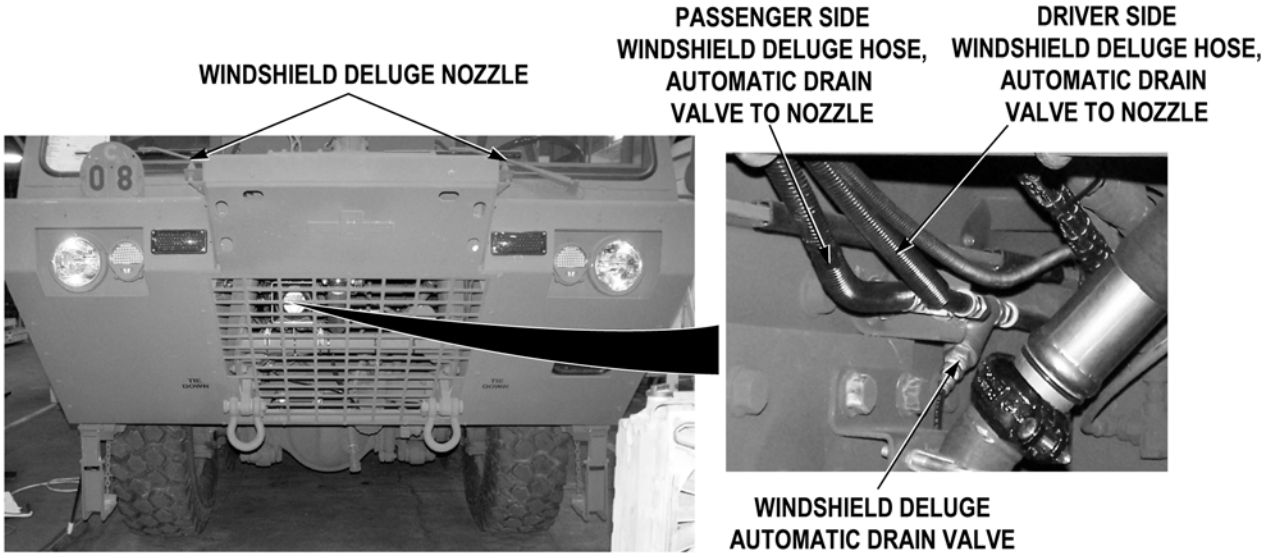
Step 2. Remove pump house panel H (WP 0341). Put WINDSHIELD DELUGE switch to on position (WP 0004). Check if windshield deluge pump operates.

If windshield deluge pump does not operate, go to Step 11.

Step 3. Check if water is delivered from at least one windshield deluge nozzle, when windshield deluge system is operating.

If water is not delivered to both windshield deluge nozzles, go to Step 5.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

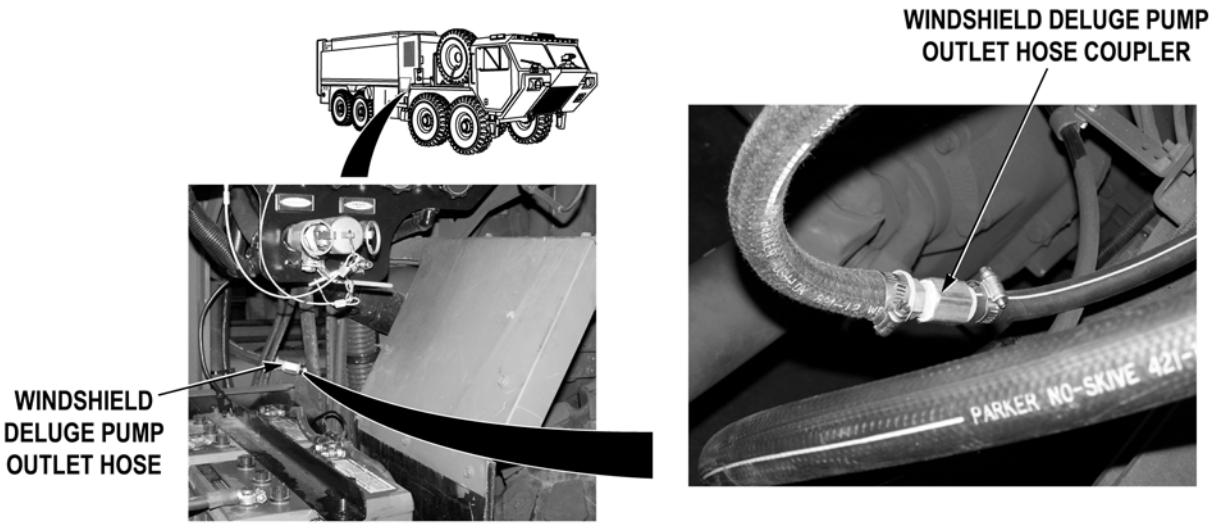


Step 4. Put WINDSHIELD DELUGE switch to off position (WP 0004). Remove skid plate grille (WP 0350). Check hose from windshield deluge automatic drain valve to non-operating nozzle for leaks, kinks, and damage.

a. If hose is free from leaks, kinks, and damage, replace non-operating windshield deluge nozzle (WP 0368).

b. If hose is not free from leaks, kinks, or damage, replace hose (WP 0322).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Water may be expelled with force at windshield pump, when operating windshield deluge system. Place suitable container under windshield pump outlet when performing Step 5.

Step 5. Put WINDSHIELD DELUGE switch to off position (WP 0004). Place suitable container under windshield deluge pump outlet. Disconnect hose from windshield deluge pump outlet hose coupler. While an assistant puts WINDSHIELD DELUGE switch to on position (WP 0004), check if water is delivered from windshield deluge pump outlet hose.

If water is not delivered, go to Step 7.

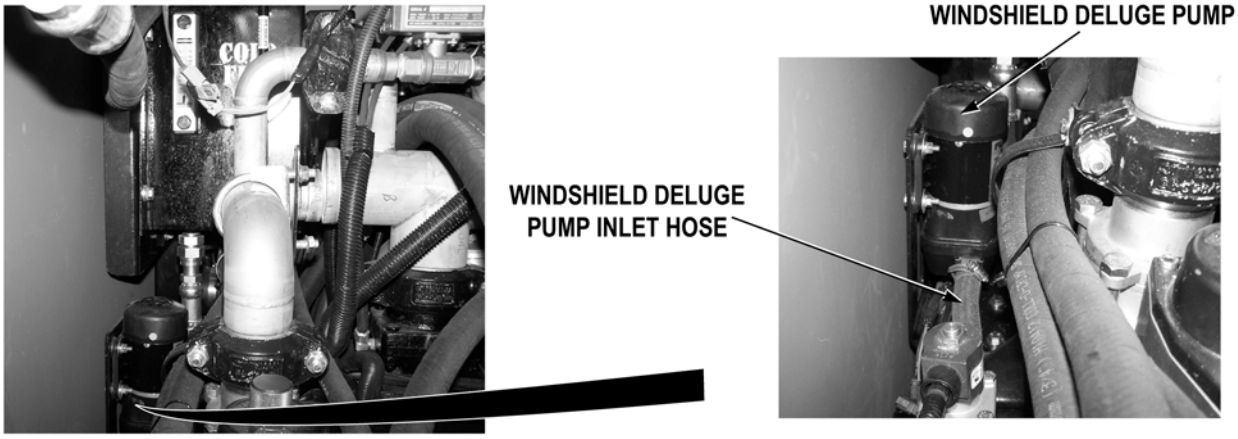
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 6. Put WINDSHIELD DELUGE switch to off position (WP 0004). Connect hose to windshield deluge pump outlet hose coupler. Remove strainer screen from windshield deluge automatic drain valve (WP 0326). Check if automatic drain valve strainer screen is clogged.

a. If strainer is free from clogs, replace hose from windshield deluge pump to windshield deluge automatic drain valve (WP 0322).

b. If strainer is not free from clogs, clean screen or replace windshield deluge automatic drain valve (WP 0326).

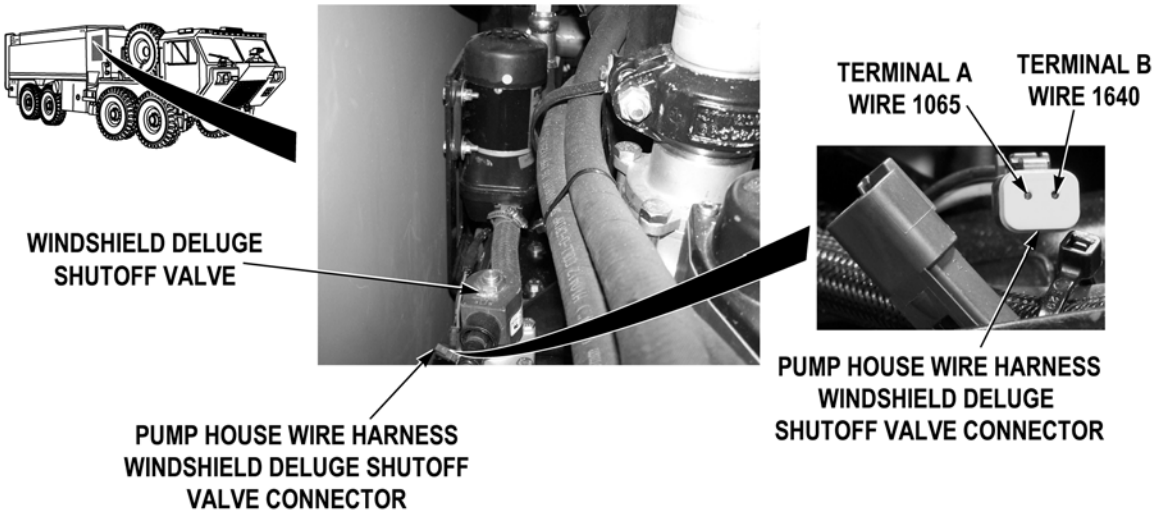
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Put WINDSHIELD DELUGE switch to off position (WP 0004). Connect hose to windshield deluge pump outlet. Place suitable container under windshield deluge pump inlet. Disconnect hose from windshield deluge pump inlet (WP 0276). While an assistant puts WINDSHIELD DELUGE switch to on position (WP 0004), check if water is delivered from windshield deluge pump inlet hose.

If water is delivered, replace windshield deluge pump (WP 0276).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Put WINDSHIELD DELUGE switch to off position (WP 0004). Connect hose to windshield deluge pump inlet (WP 0276). Disconnect pump house wire harness windshield deluge shutoff valve connector. Put WINDSHIELD DELUGE switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 1065 (pink) at windshield deluge shutoff valve connector, terminal A and a known good ground.

If 22 to 28 VDC are not present, repair wire 1065 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 9. Put WINDSHIELD DELUGE switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump house wire harness wire 1640 (black) from windshield deluge shutoff valve connector, terminal B and a known good ground.

If there is no continuity, repair wire 1040 in pump house harness if repairable (TM 9-2320-315-14&P), or replace pump house harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

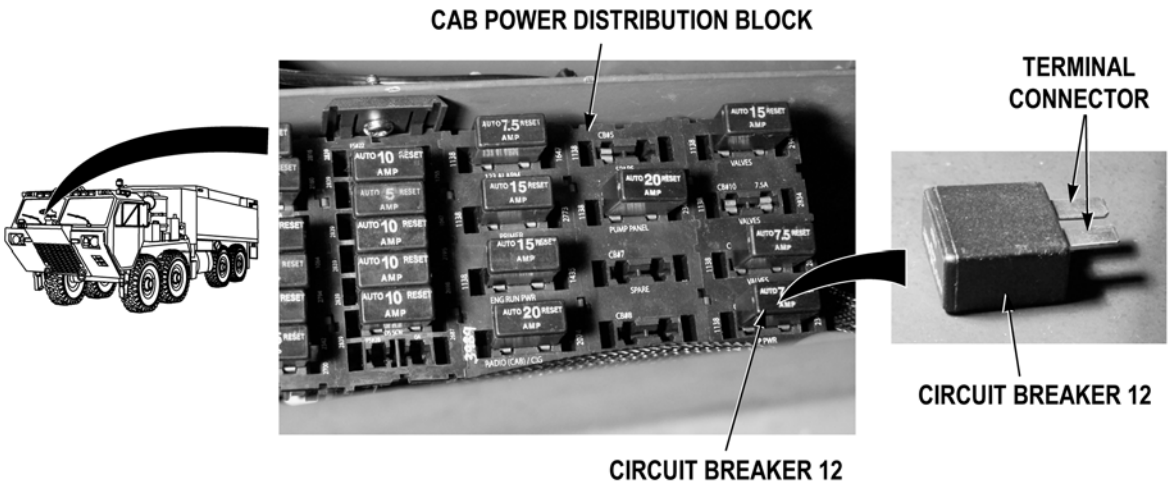
NOTE

Water tank must be drained before removing windshield deluge shutoff valve strainer screen. Water will be discharge from water tank uncontrolled, when windshield deluge valve strainer is removed.

Step 10. Remove windshield deluge shutoff valve strainer screen (WP 0367). Check if strainer screen is clogged.

a. If strainer screen is clogged, clean or replace strainer screen (WP 0367).

b. If strainer screen is not clogged, replace windshield deluge shutoff valve (WP 0386).



WARNING

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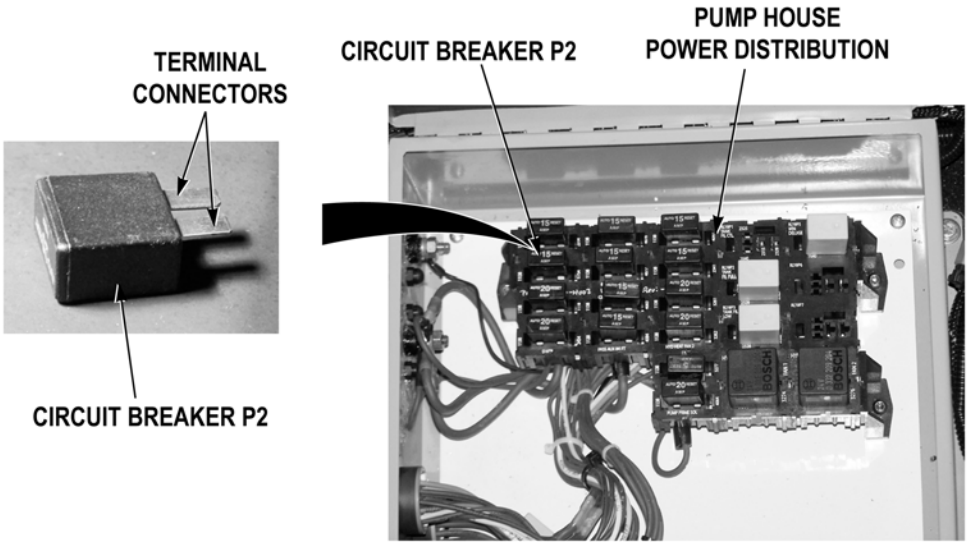
Step 11. Put WINDSHIELD DELUGE switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 12 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker 12 (WP 0240).

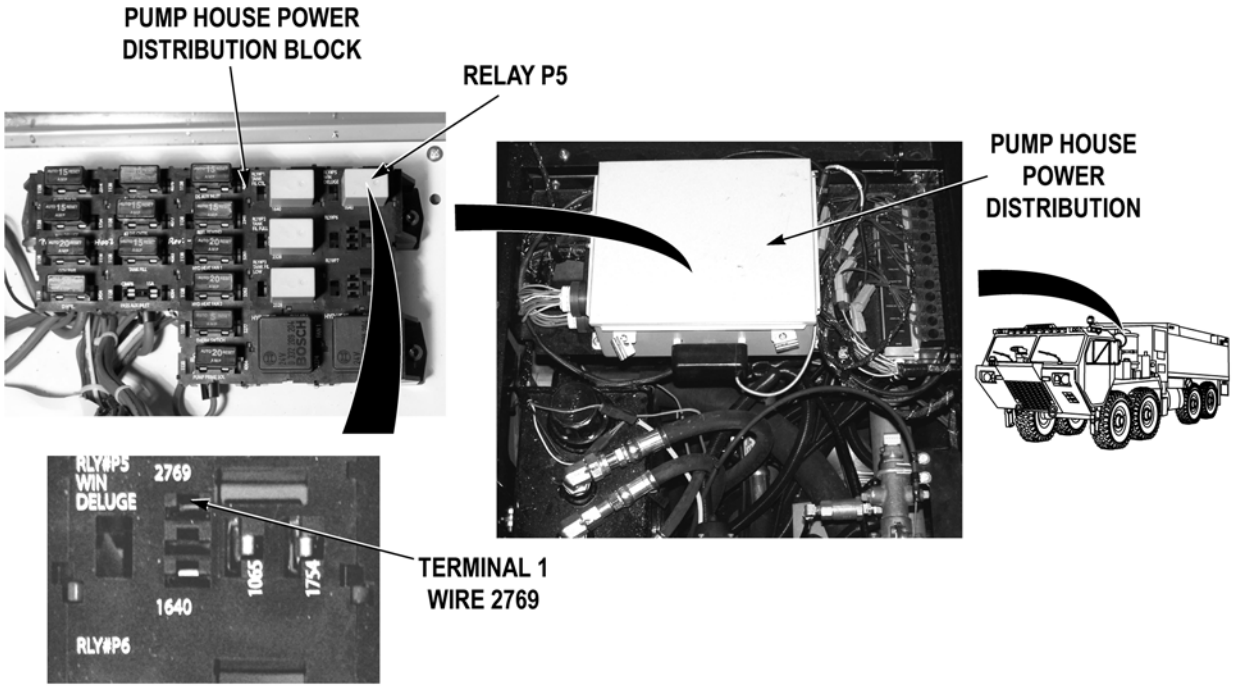
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Install circuit breaker 12 (WP 0240). Remove pump house panel K (WP 0341). Open pump house power distribution (WP 0261). Remove circuit breaker P2 (WP 0261). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker P2 (WP 0261).

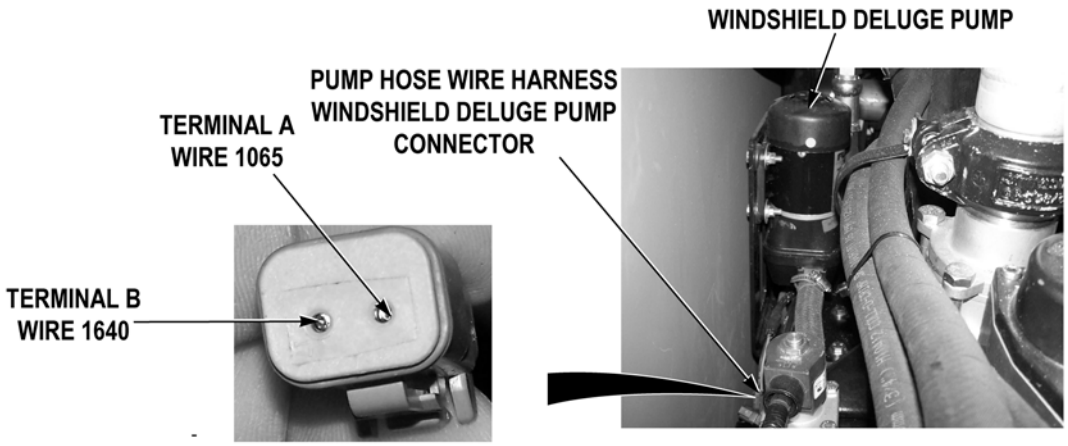
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Remove relay P5 from pump house power distribution block (WP 0261). Put WINDSHIELD DELUGE switch to on position (WP 0004). Check for 22 to 28 VDC between wire 2769 (red) at pump house power distribution block relay P5, terminal 1 and known good ground.

If 22 to 28 VDC are not present, go to Step 21.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Install relay P5 (WP 0261). Disconnect pump house wire harness windshield deluge pump connector. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 1065 (pink) at windshield deluge pump connector, terminal A and a known good ground.

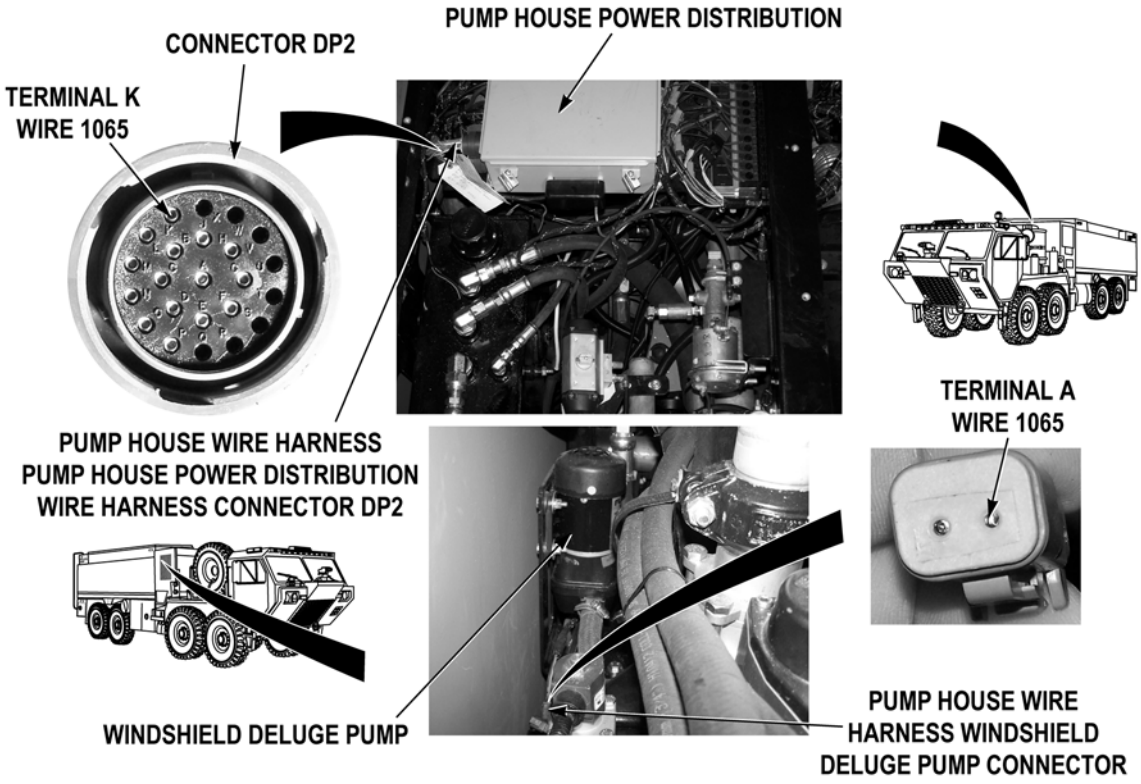
If 22 to 28 VDC are not present, go to Step 16.

Step 15. Put WINDSHIELD DELUGE switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump house wire harness wire 1640 (black) from windshield deluge pump connector, terminal B to a known good ground.

a. If there is no continuity, repair wire 1640 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

b. If there is continuity, replace windshield deluge pump (WP 0276).

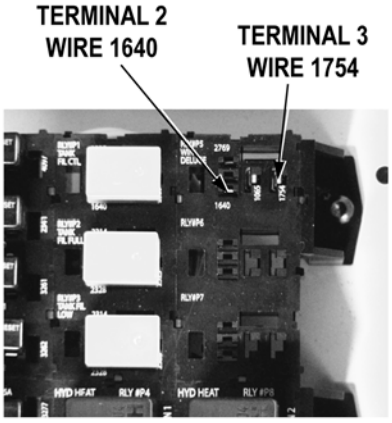
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

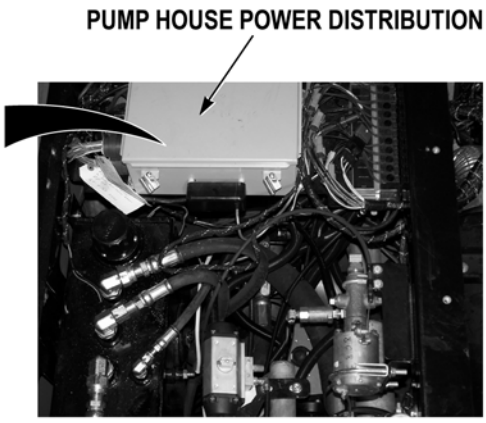


Step 16. Put WINDSHIELD DELUGE switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across pump house wire harness wire 1065 (pink) from pump house wire harness connector DP2, terminal K to pump house wire harness windshield deluge pump connector, terminal A.

If there is no continuity, go to Step 20.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

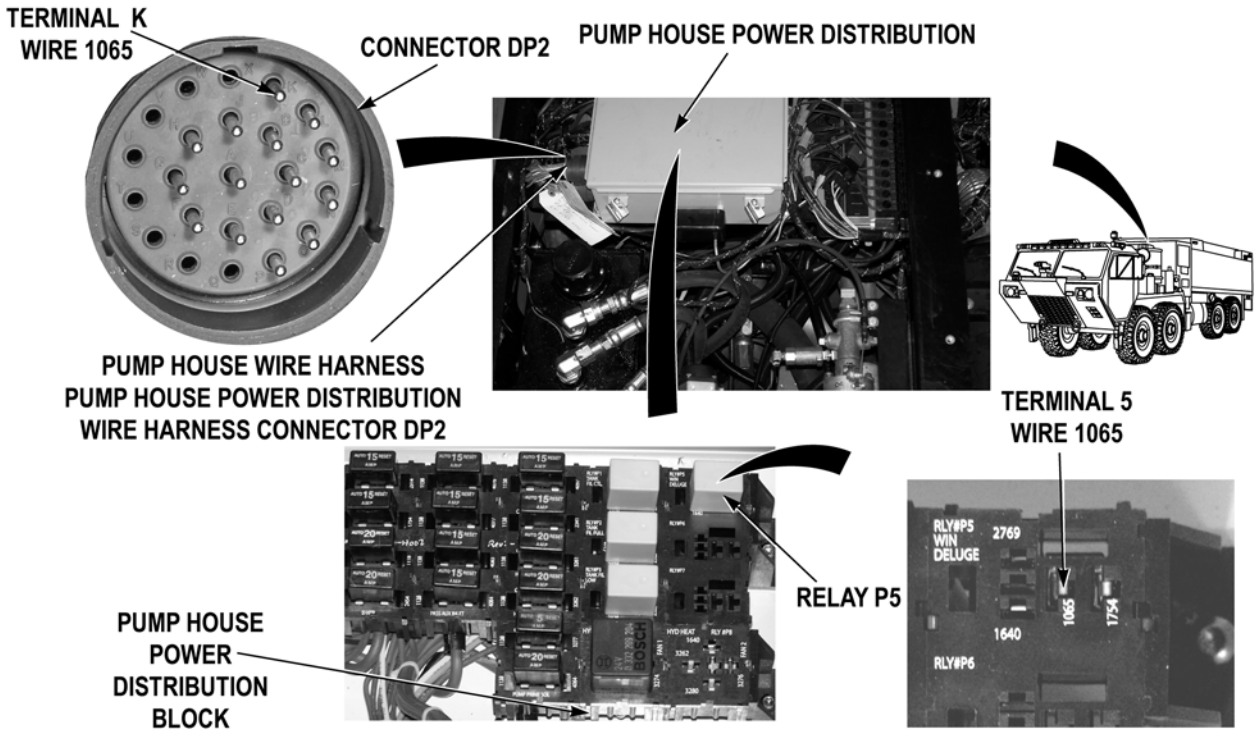
Step 17. Connect pump house wire harness windshield deluge pump connector. Connect pump house wire harness pump house power distribution wire harness connector DP2. Remove relay P5 (WP 0262). Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump house power distribution wire harness wire 1754 (red) at relay P5 connector, terminal 3 and a known good ground.

If 22 to 28 VDC are not present, replace pump house power distribution harness and block (WP 0300).

Step 18. Put WINDSHIELD DELUGE switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Check for continuity across pump house power distribution wire harness wire 1640 (black) from relay P5 connector, terminal 2 to a known good ground.

If there is no continuity, repair wire 1640 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

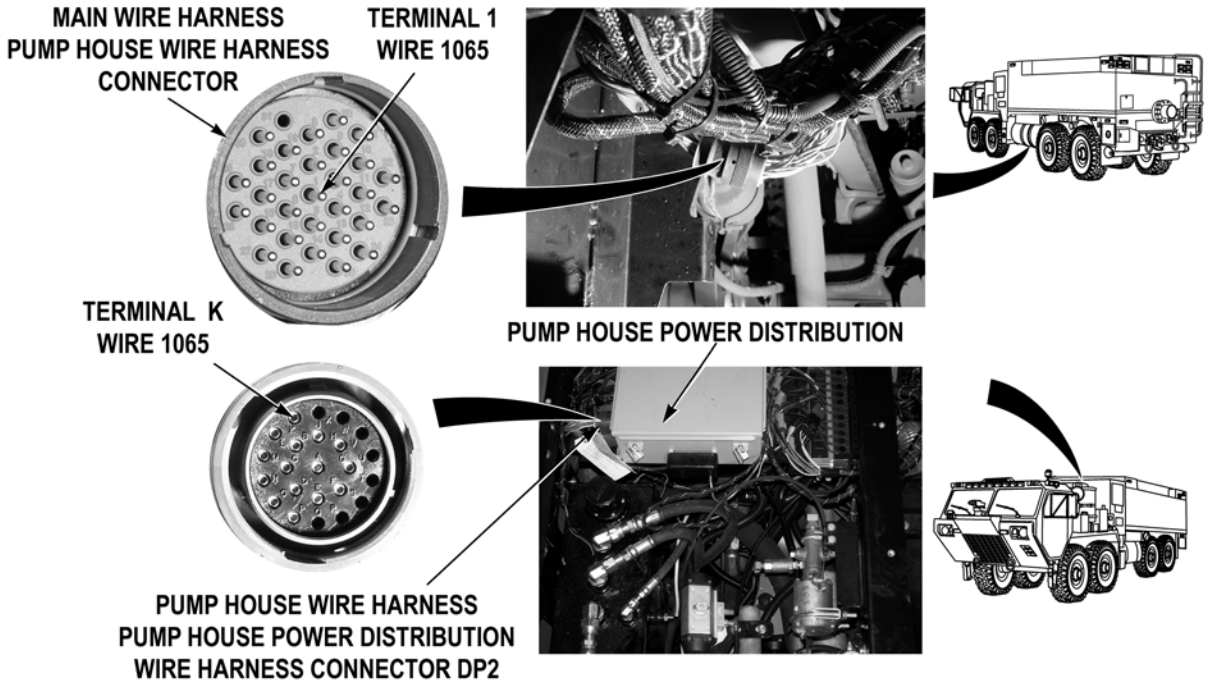


Step 19. Disconnect pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across pump house power distribution wire harness wire 1065 (pink) from relay P5 connector, terminal 5 to pump house power distribution wire harness connector DP2, terminal K.

a. If there is continuity, replace relay P5 (WP 0262).

b. If there is no continuity, repair wire 1065 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

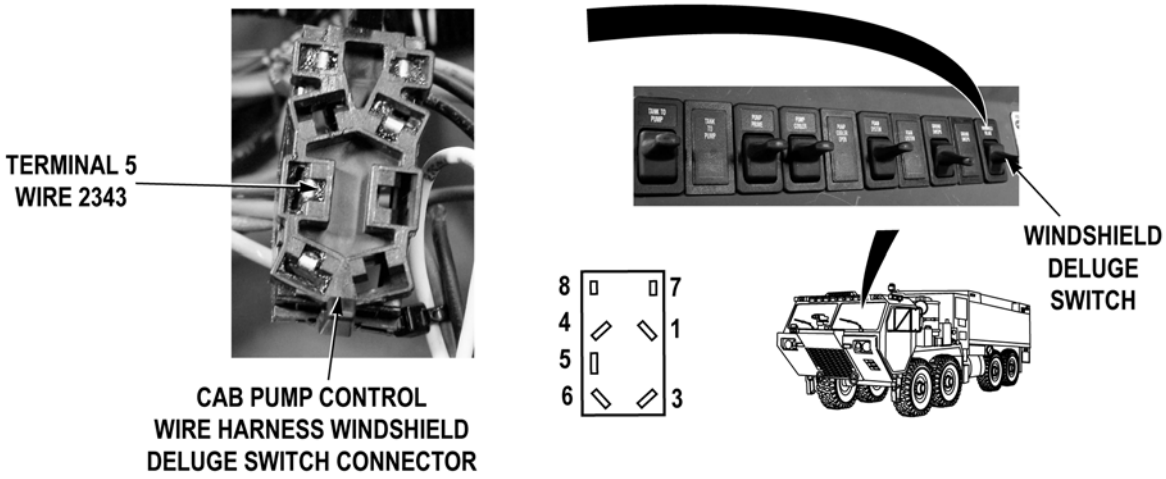
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 20. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 1065 (pink) from pump house wire harness connector DP2, terminal K to pump house wire harness connector, terminal 1.

a. If there is continuity, repair wire 1065 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness (WP 0300).

b. If there is no continuity, repair wire 1065 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



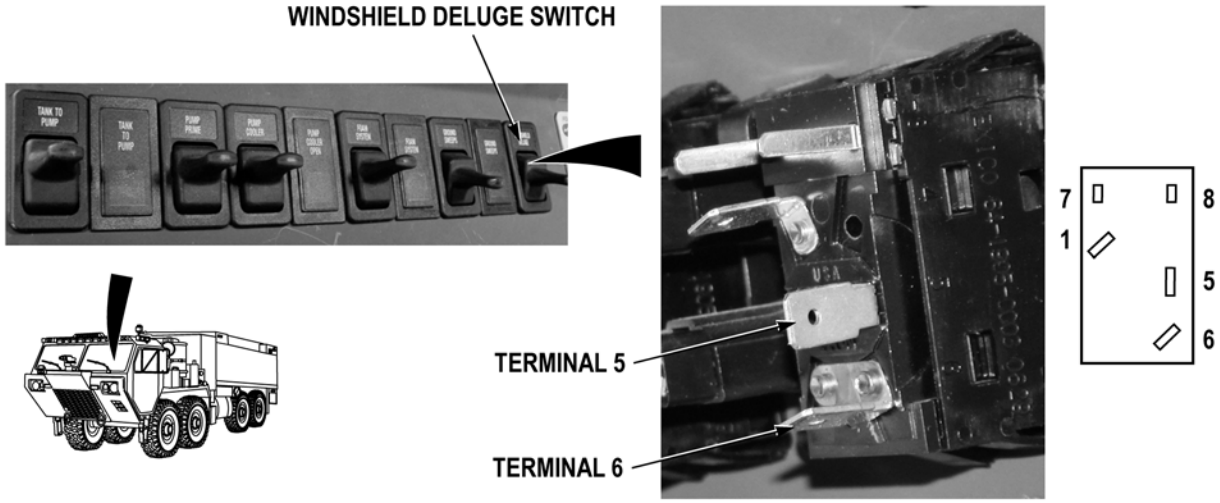
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 21. Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness WINDSHIELD DELUGE switch connector. Check for 22 to 28 VDC between cab pump control wire harness wire 2343 (red) at WINDSHIELD DELUGE switch connector, terminal 5 and a known good ground.

If 22 to 28 VDC are not present, go to Step 26.

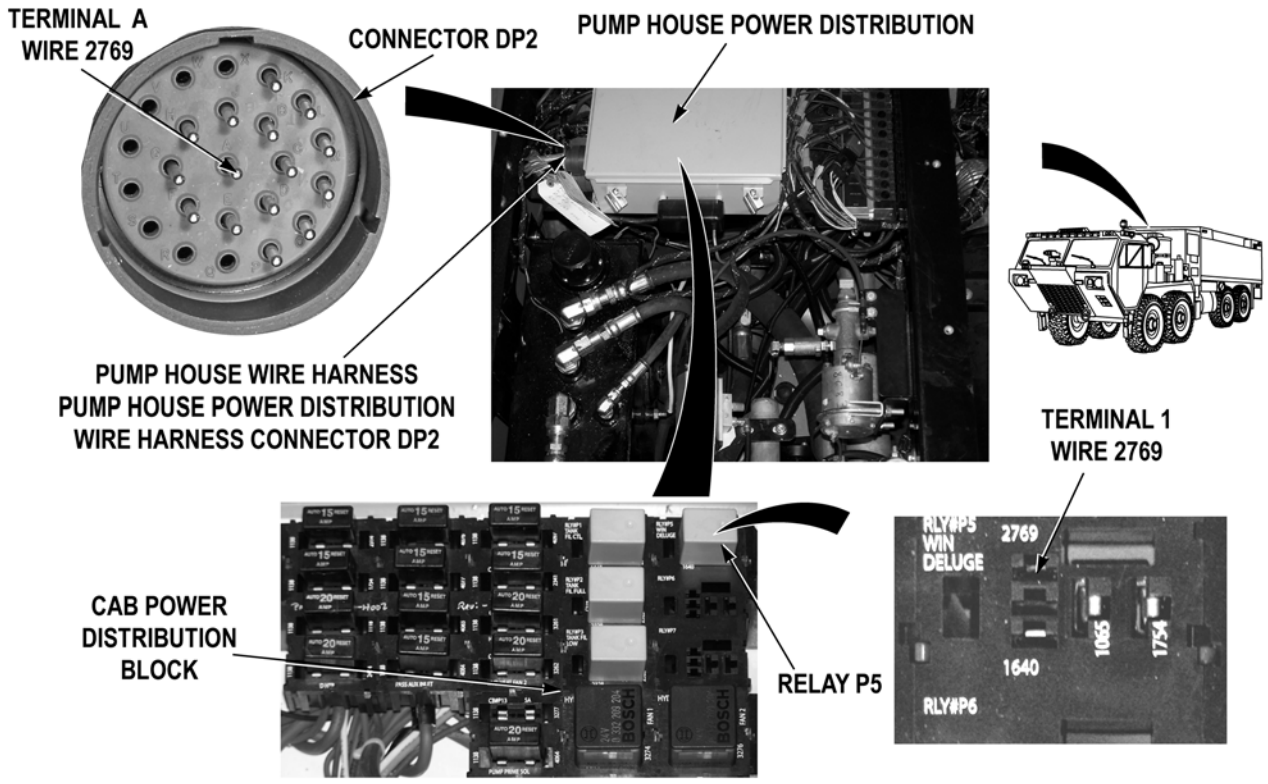
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 22. Pull battery disconnect switch to off position (WP 0007). Check for continuity across WINDSHIELD DELUGE switch, from terminal 5 to terminal 6, when switch is put to on position.

If there is no continuity, replace WINDSHIELD DELUGE switch (WP 0197).

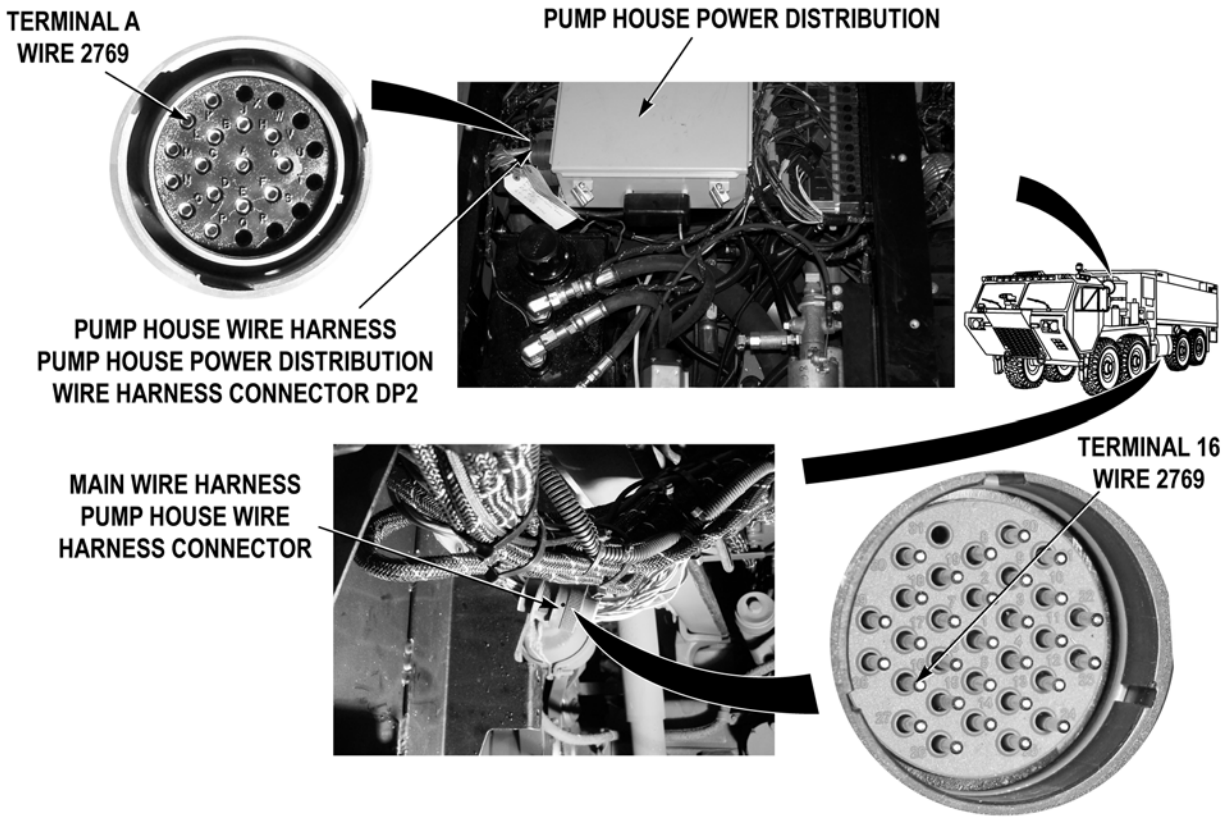
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 23. Disconnect pump house wire harness pump house power distribution wire harness connector DP2. With a test lead set, check for continuity across pump house power distribution wire harness wire 2769 (red) from pump house power distribution wire harness connector DP2, terminal A to pump house power distribution block relay P5, terminal 1.

If there is no continuity repair wire 2769 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

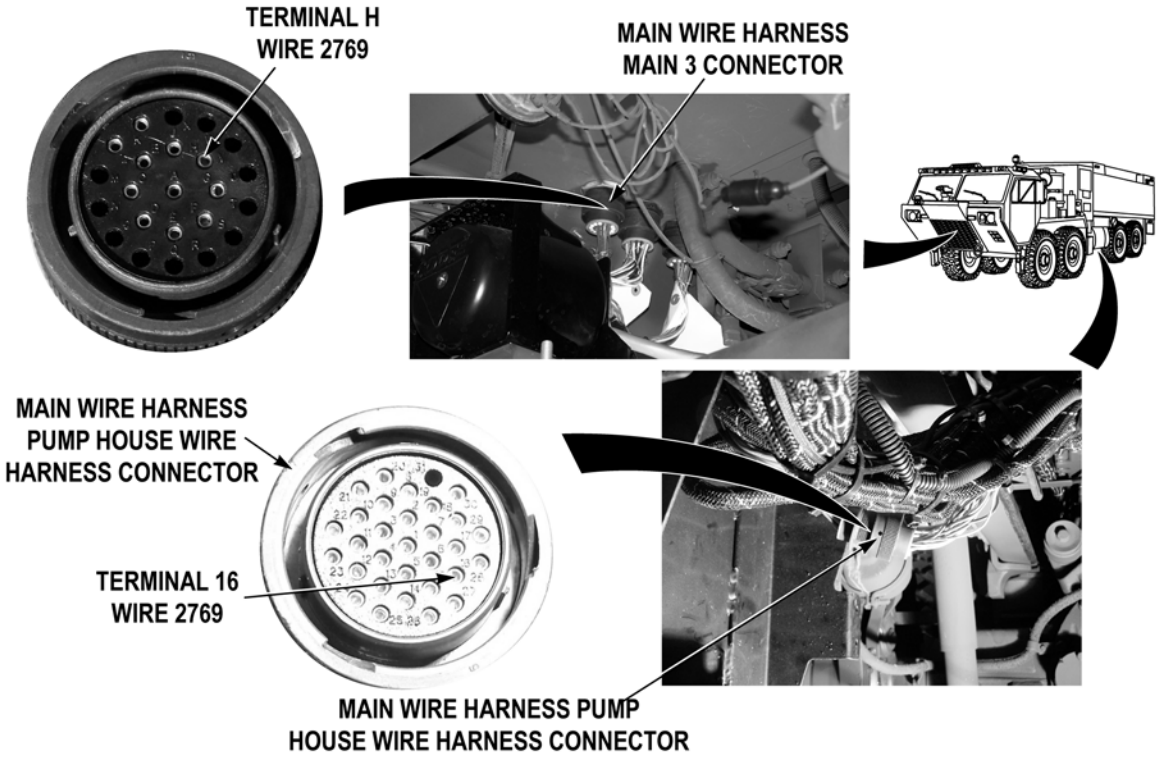
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 24. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 2769 (red) from pump house wire harness pump house power distribution wire harness connector DP2, terminal A to main wire harness pump house wire harness connector, terminal 16.

If there is no continuity, repair wire 2769 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

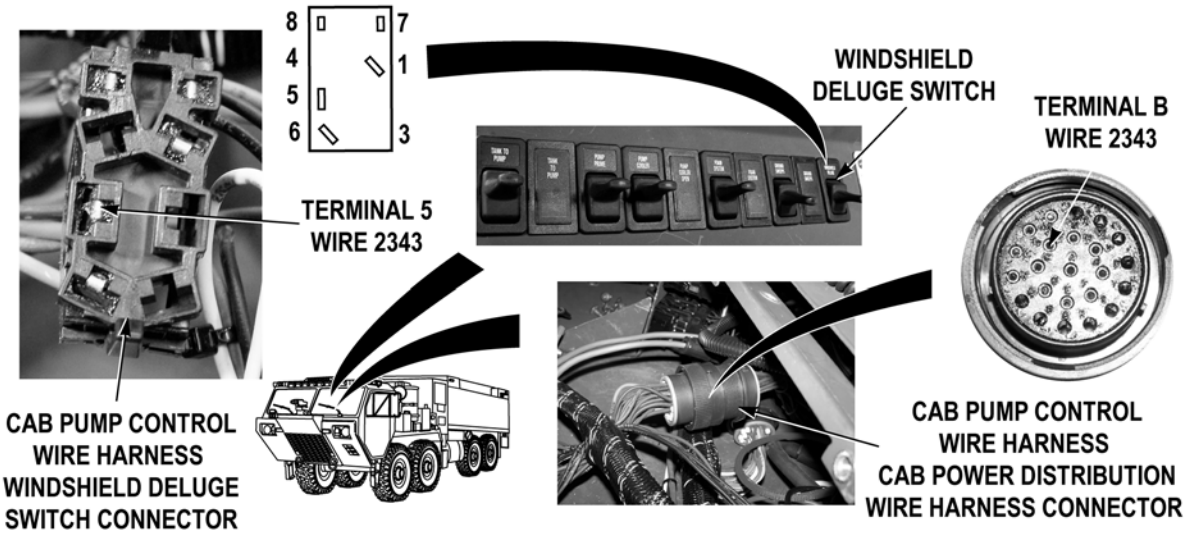


Step 25. Remove skid plate grille (WP 0350). Disconnect main wire harness main 3 connector. With a test lead set, check for continuity across main wire harness wire 2769 (red) from main wire harness main 3 connector, terminal H, to main wire harness pump house wire harness connector, terminal 16.

a. If there is continuity, repair wire 2769 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If there is no continuity, repair wire 2769 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 26. Disconnect cab power distribution wire harness cab pump control wire harness connector. With a test lead set, check for continuity across cab pump control wire harness wire 2343 (red) from cab pump control wire harness connector, terminal B to WINDSHIELD DELUGE switch connector, terminal 5.

a. If there is continuity, repair wire 2343 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2343 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

CAB SWITCH BACKLIGHTING DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0197
WP 0203

References (continued)
WP 0240
WP 0242
WP 0279
WP 0280
WP 0281

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

CAB SWITCH BACKLIGHTING DOES NOT OPERATE

NOTE

Cab switch backlights are low intensity red indicators. Close observation may be required to determine if cab switch backlights are illuminated.

Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Turn lighting control PANEL lever to BRT position (TM 9-2320-279-10). Check if backlights on dash panel switches and gauges illuminate.

If backlights on dash panel switches and gauges do not illuminate, troubleshoot Panel Lights Do Not Operate (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

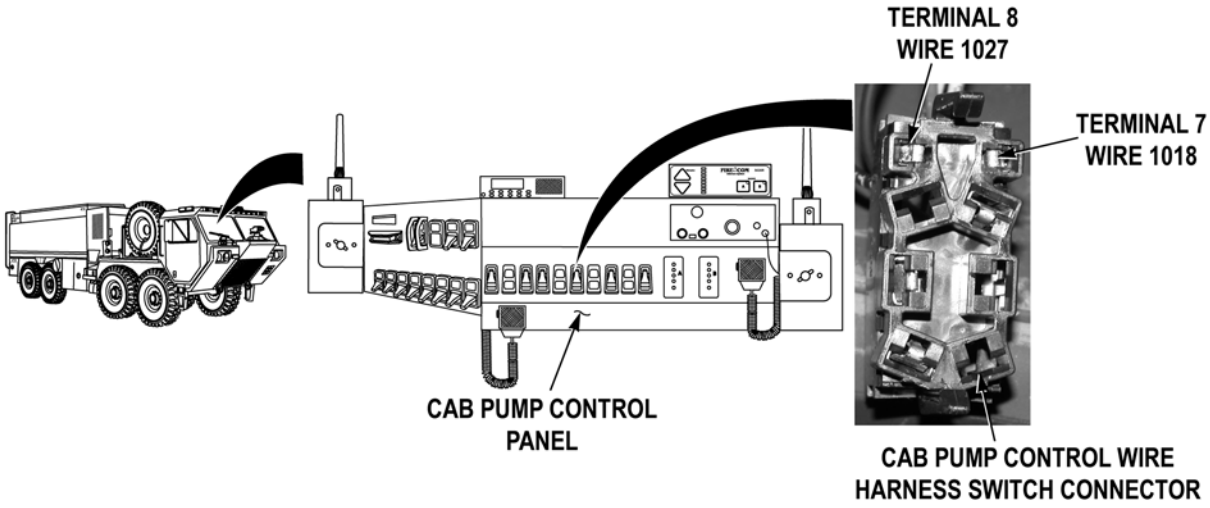
Step 2. Check if any backlights on cab instrument panel or cab pump control rocker switches illuminate.

If any backlights on cab instrument panel or cab pump control rocker switches do not illuminate, go to Step 8.

Step 3. Check if backlights on cab pump control rocker switches illuminate.

If all backlights on pump control rocker switches do not illuminate, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness switch connector from non-operating switch. Check for 22 to 28 VDC between cab pump control wire harness wire 1018 (violet) at cab pump control wire harness non-operating switch connector, terminal 7 and a known good ground.

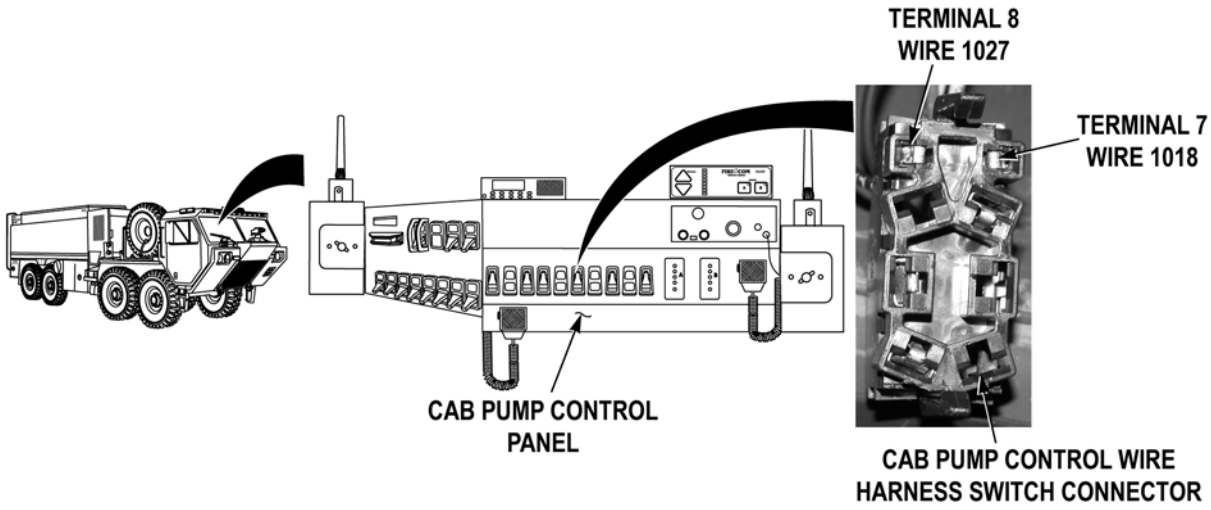
If 22 to 28 VDC are not present, repair wire 1018 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab pump control wire harness wire 1027 (black) from cab pump control wire harness non-operating switch connector, terminal 8 to a known good ground.

a. If there is continuity, replace non-operating rocker switch (WP 0197).

b. If there is no continuity, repair wire 1027 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

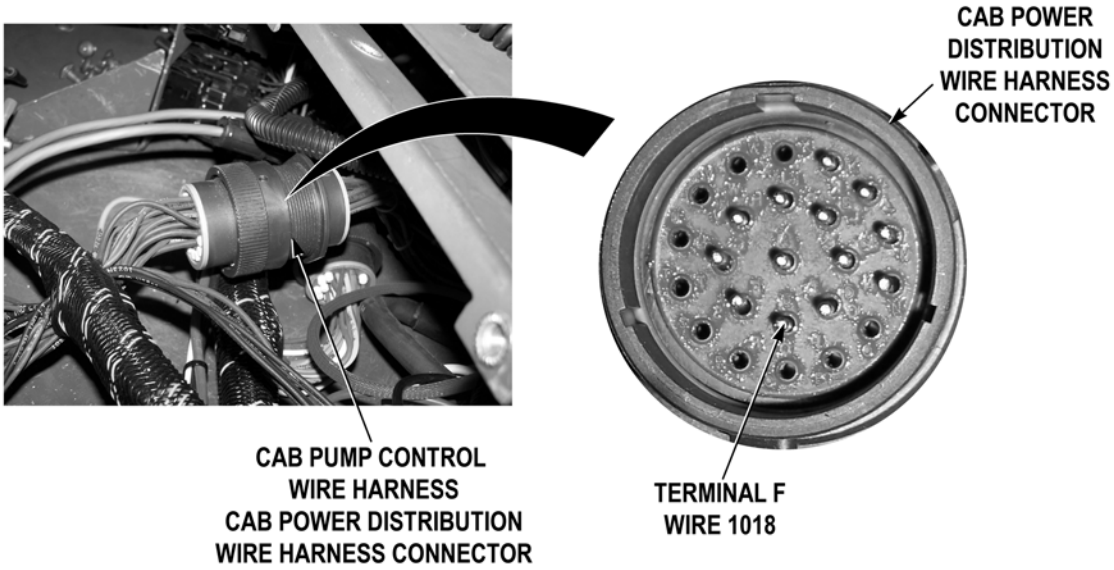
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness switch connector from non-operating switch. Check for 22 to 28 VDC between cab pump control wire harness wire 1018 (violet) at non-operating cab pump control wire harness switch connector, terminal 7 and a known good ground.

If 22 to 28 VDC are present, repair wire 1027 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 1018 (violet) at cab power distribution wire harness connector, terminal F and a known good ground.

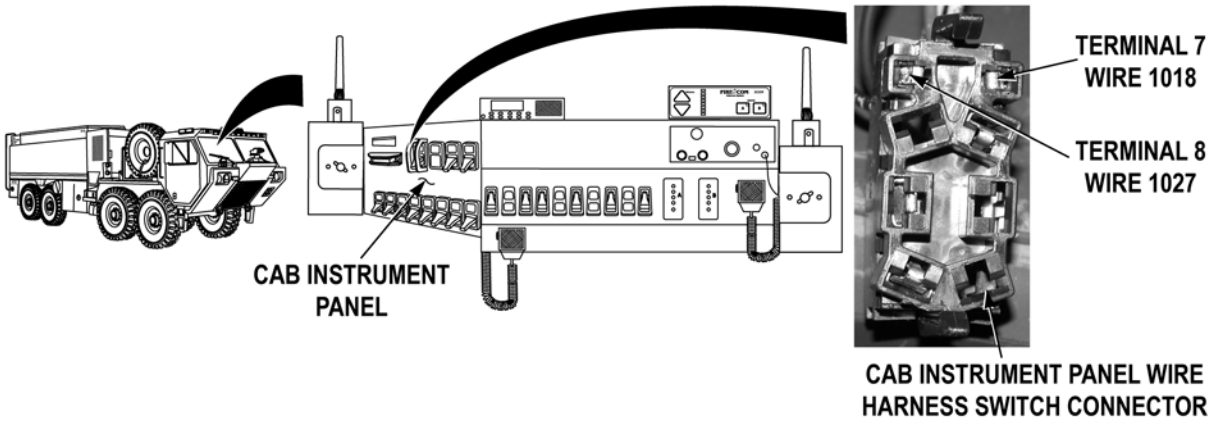
a. If 22 to 28 VDC are present, repair wire 1018 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

b. If 22 to 28 VDC are not present, repair wire 1018 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

Step 8. Check if any backlights on cab pump control switches illuminate.

If all backlights on cab pump control switches do not illuminate, go to Step 11.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Remove cab instrument panel C (WP 0203). Disconnect cab instrument panel wire harness switch connector from non-operating switch connector. Check for 22 to 28 VDC between cab instrument panel wire harness wire 1018 (violet) at non-operating cab instrument panel wire harness switch connector, terminal 7 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1018 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 10. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab instrument panel wire harness wire 1027 (black) from non-operating cab instrument panel wire harness switch connector, terminal 8 to a known good ground.

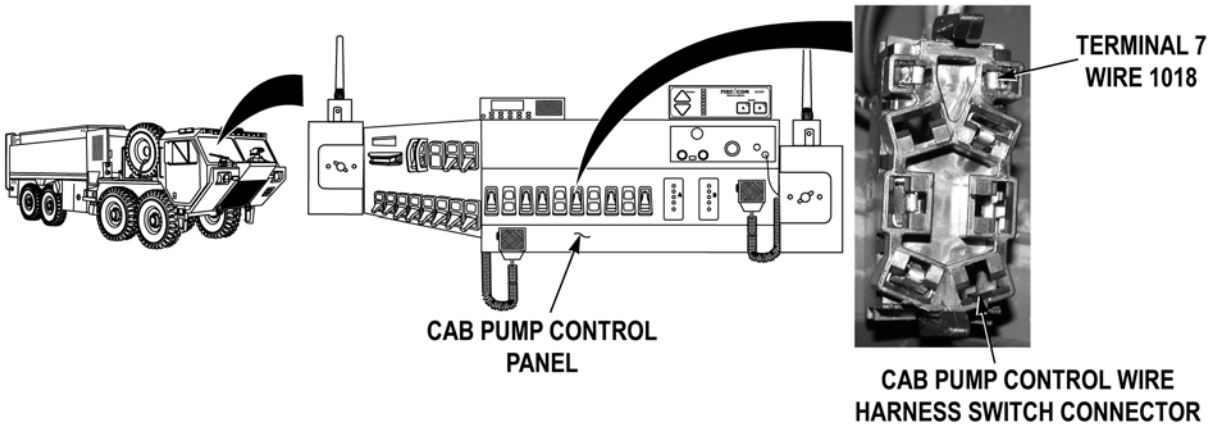
a. If there is continuity, replace non-operating rocker switch (WP 0197).

b. If there is no continuity, repair wire 1027 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 11. Check if backlights on cab instrument panel switches illuminate.

If backlights on cab instrument panel switches do not illuminate, go to Step 14.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 12. Remove cab instrument panel C (WP 0203). Disconnect cab pump control wire harness non-operating switch connector. Check for 22 to 28 VDC between cab pump control wire harness wire 1018 (violet) at non-operating cab pump control wire harness switch connector (WP 0004), terminal 7 and a known good ground.

If 22 to 28 VDC are present, repair wire 1027 in cab pump control wire harness (TM 9-2320-315-14&P) or replace cab pump control wire harness (WP 0281).

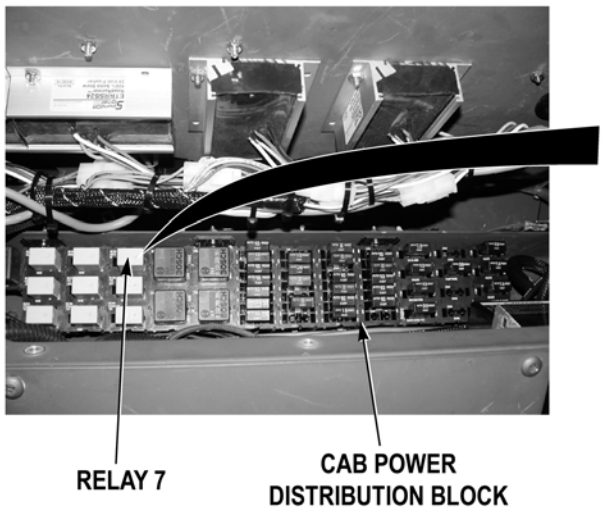
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

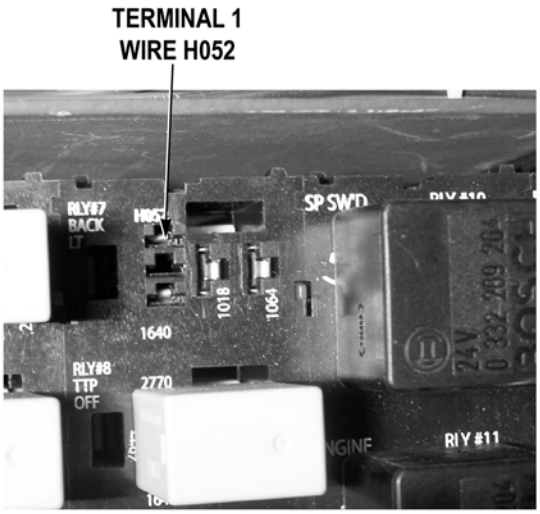
Step 13. Remove cab instrument panel A (WP 0203). Disconnect cab pump control wire harness cab power distribution wire harness connector. With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 1018 (violet) at cab power distribution wire harness connector, terminal F and a known good ground.

a. If 22 to 28 VDC are present, repair wire 1018 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0279).

b. If 22 to 28 VDC are not present, repair wire 1018 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





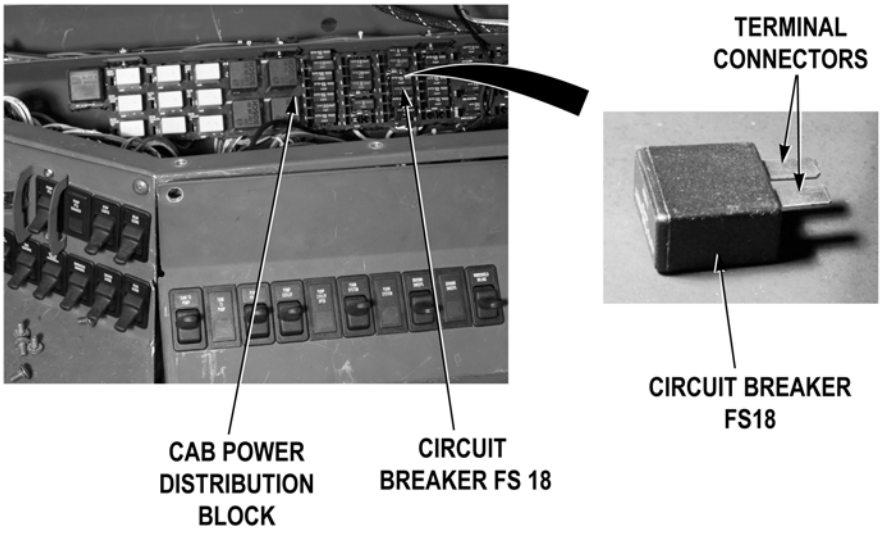
NOTE

Wire numbers with H prefix indicate that circuit is an extension of a HEMTT circuit.

Step 14. Remove cab instrument panel A (WP 0203). Remove relay 7 (WP 0242). Check for 22 to 28 VDC between cab power distribution wire harness wire H052 (white) at relay 7 connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, go to Step 19.

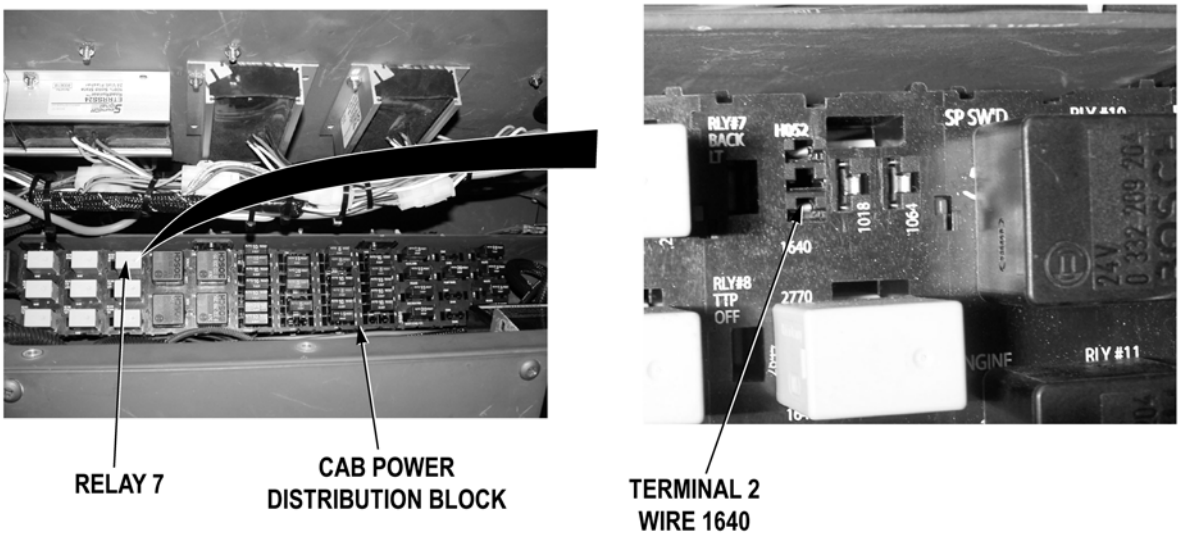
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove circuit breaker FS 18 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 18 (WP 0240).

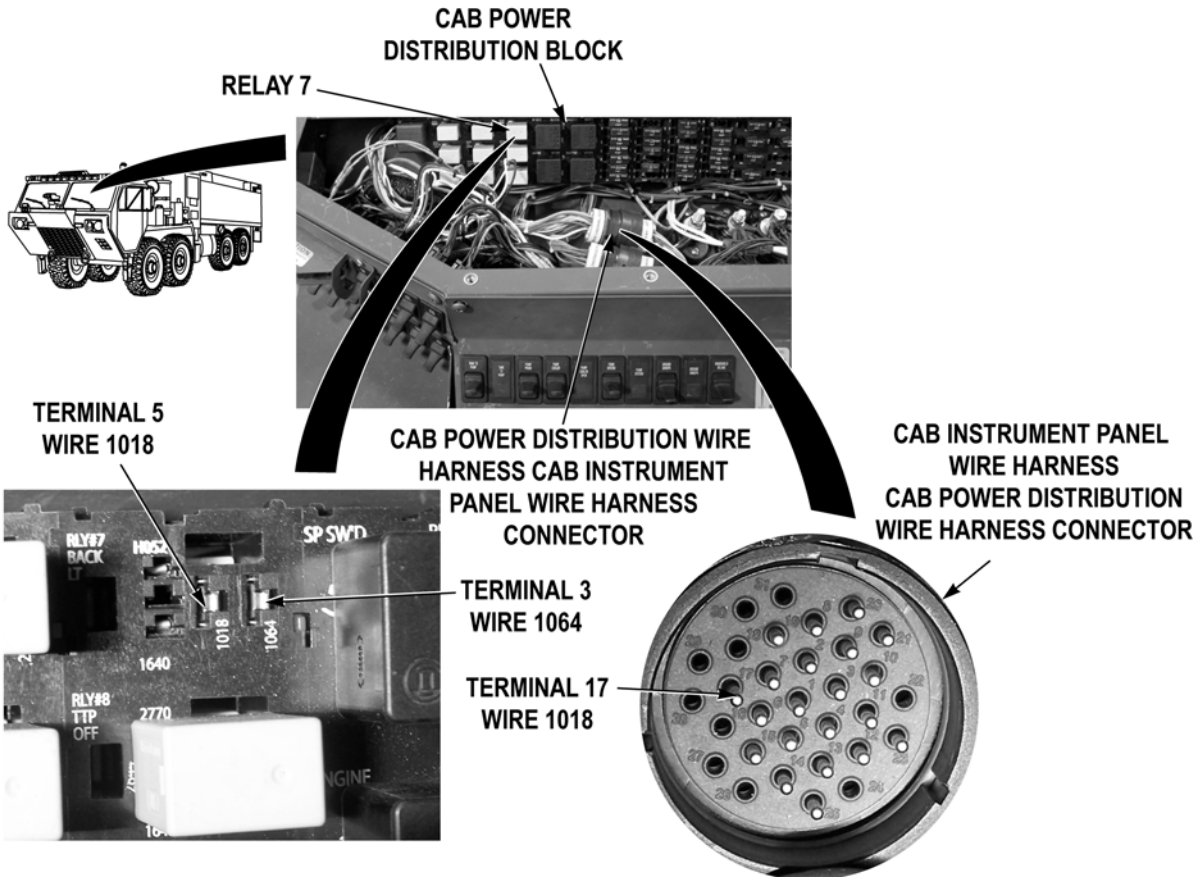
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Install circuit breaker FS 18 (WP 0240). Check for continuity across cab power distribution wire harness wire 1640 (black) from relay 7 connector, terminal 2 to a known good ground.

If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab power distribution wire harness wire 1018 (violet) from relay 7 connector, terminal 5 to cab instrument panel wire harness cab power distribution wire harness connector, terminal 17.

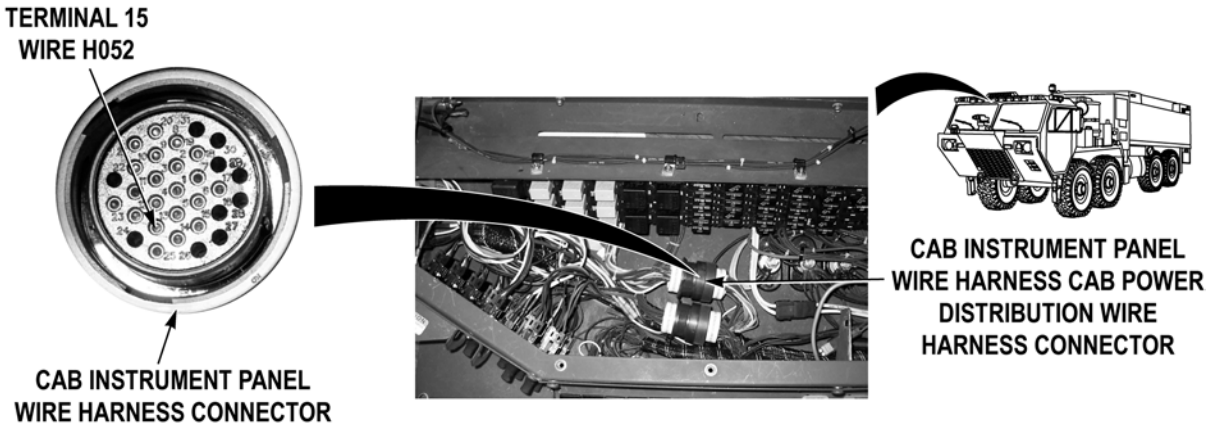
If there is no continuity, repair wire 1018 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

Step 18. Connect cab instrument panel wire harness cab power distribution wire harness connector. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between cab power distribution wire harness wire 1064 (violet) at relay 7 connector, terminal 3 and a known good ground.

a. If 22 to 28 VDC are not present, replace cab power distribution wire harness and block (WP 0280).

b. If 22 to 28 VDC are present, replace relay 7 (WP 0242).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire H052 (white) at cab instrument panel wire harness connector, terminal 15 and a known good ground.

a. If 22 to 28 VDC are present, repair wire H052 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If 22 to 28 VDC are not present, repair wire H052 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

DIRECT TANK FILL AUTO INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0063
WP 0205

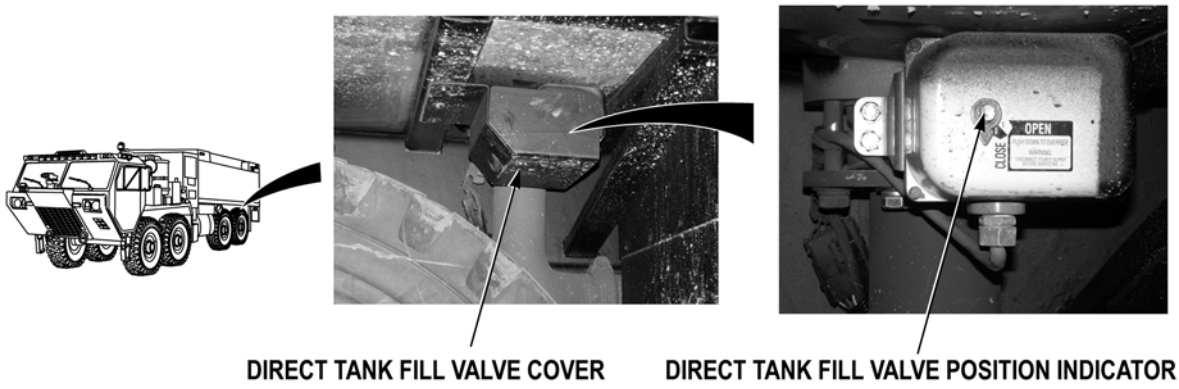
References (continued)
WP 0211
WP 0212
WP 0304
WP 0313

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DIRECT TANK FILL AUTO INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



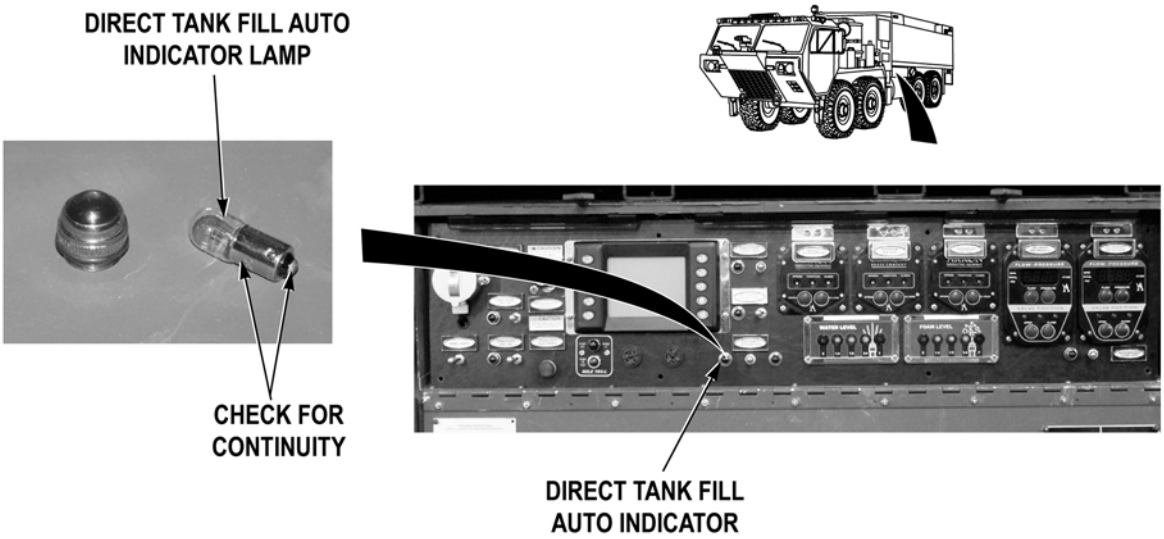
NOTE

- Ensure cap is installed tightly on direct tank fill connector during this procedure. Or, connect hose to direct tank fill connector to drain water into appropriate container or to ground. If direct tank fill valve opens during this procedure, water will discharge from tank uncontrolled.
- Valve operations can be checked by observing valve shaft rotation.
- Step 1 will ensure that direct tank fill system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

Step 1. Remove direct tank fill valve cover (WP 0313). Push battery disconnect switch to on position (WP 0007). While an assistant puts pump operator's panel DIRECT TANK FILL switch to OPEN position (WP 0004). Check if direct tank fill valve operates to open position.

If direct tank fill valve does not operate to open position, troubleshoot Direct Tank Fill Valve Does Not Operate Properly (Auto or Manual Mode) (WP 0063).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



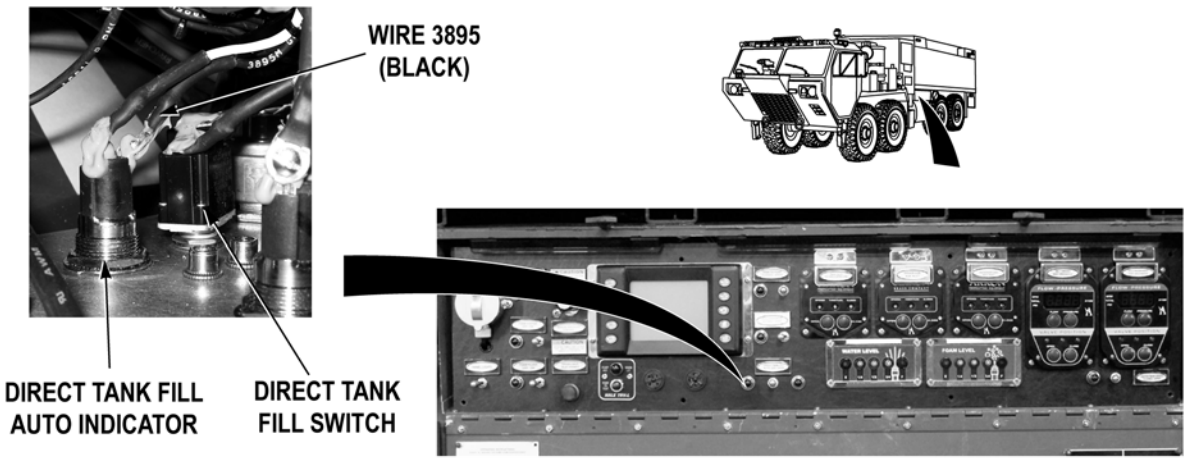
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 2. Put pump operator's panel DIRECT TANK FILL switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel DIRECT TANK FILL AUTO indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace lamp (WP 0212).

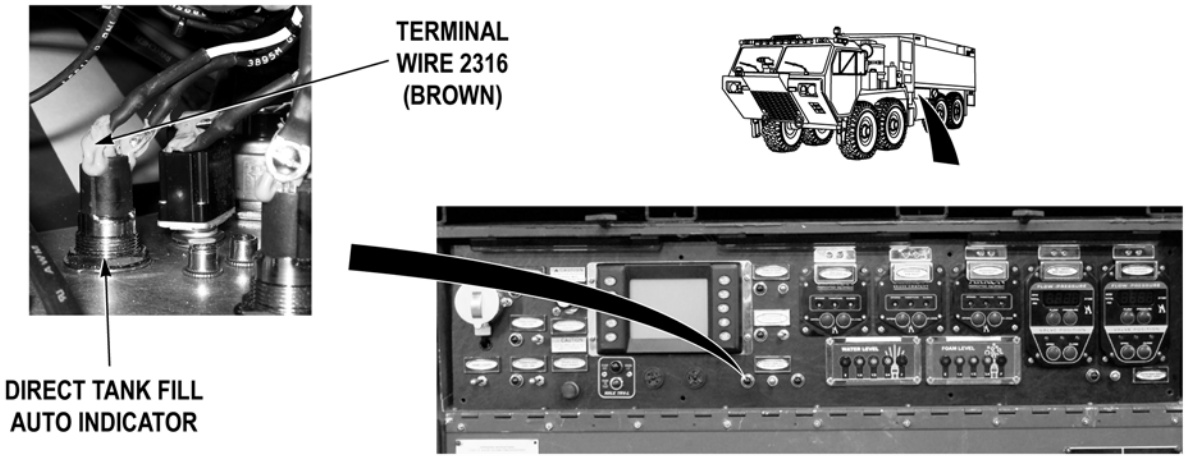
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Install lamp in pump operator's panel DIRECT TANK FILL AUTO indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel DIRECT TANK FILL AUTO indicator to a known good ground.

If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel DIRECT TANK FILL switch to AUTO position (WP 0004). Check for 22 to 28 VDC at pump operator's panel wire harness wire 2316 (brown) from DIRECT TANK FILL auto indicator to a known good ground.

a. If 22 to 28 VDC are present, replace DIRECT TANK FILL AUTO indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 2316 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

DIRECT TANK FILL OPEN INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0063

References (continued)
WP 0205
WP 0211
WP 0212
WP 0304
WP 0313

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

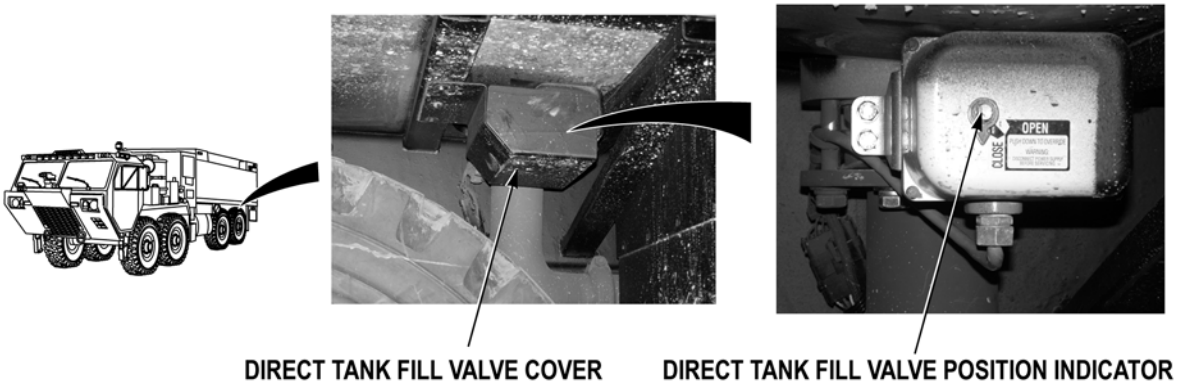
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DIRECT TANK FILL OPEN INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

NOTE

- Ensure cap is installed tightly on direct tank fill inlet during this procedure. Or, connect hose to direct tank fill inlet to drain water into appropriate container or to ground. If direct tank fill valve opens during this procedure, water will discharge from tank uncontrolled.
- Valve operations can be check by observing valve shaft rotation.
- Step 1 will ensure that direct tank fill system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

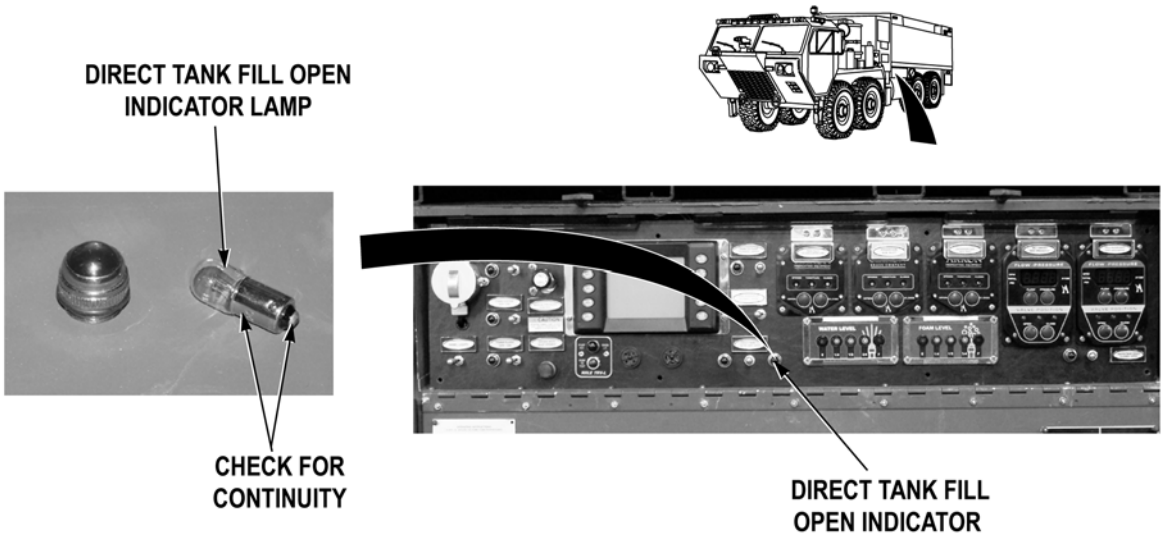
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Remove direct tank fill valve cover (WP 0313). Push battery disconnect switch to on position (WP 0007). While an assistant puts pump operator's panel DIRECT TANK FILL switch to OPEN position (WP 0004), check if direct tank fill valve operates to open position.

If direct tank fill valve does not operate to open position, troubleshoot Direct Tank Fill Valve Does Not Operate Properly (Auto or Manual Mode) (WP 0063).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



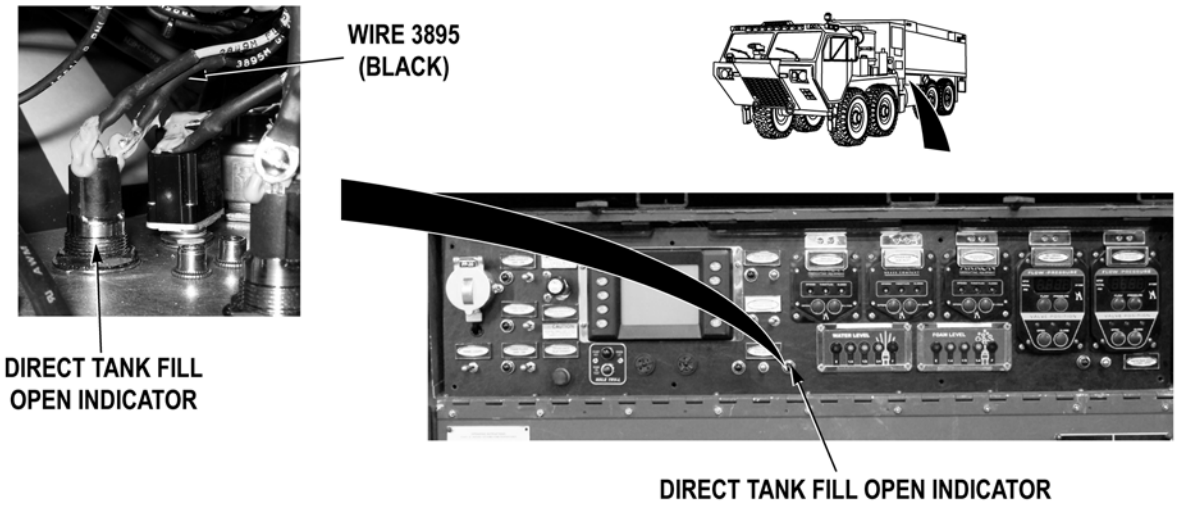
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 2. Put pump operator's panel DIRECT TANK FILL switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel DIRECT TANK FILL open indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace DIRECT TANK FILL open indicator lamp (WP 0212).

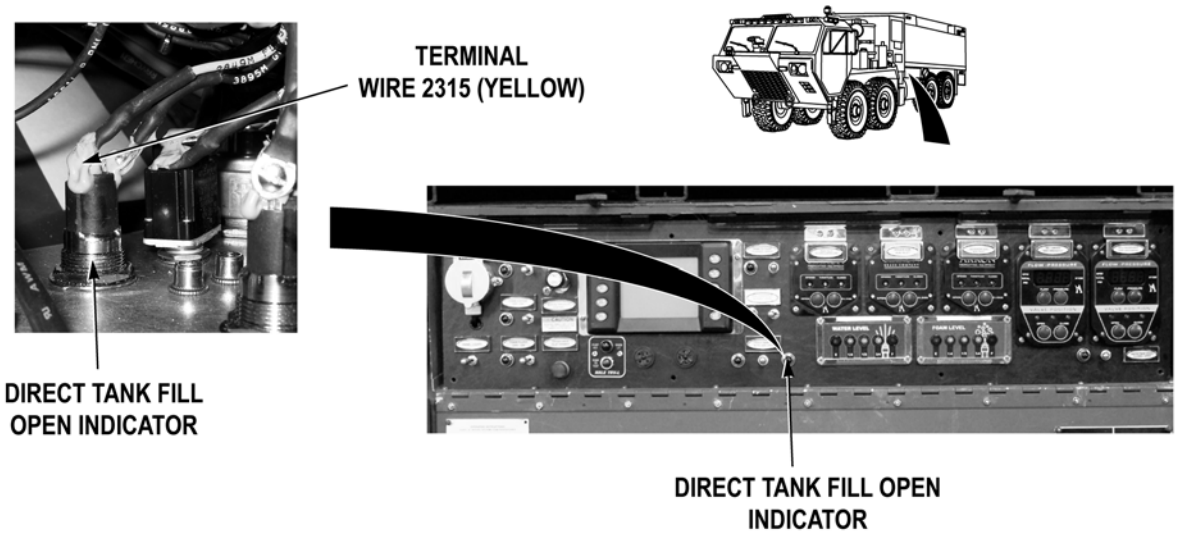
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Install lamp in pump operator's panel DIRECT TANK FILL open indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel DIRECT TANK FILL open indicator to a known good ground.

If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel DIRECT TANK FILL switch to OPEN position (WP 0024). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2315 (yellow) from pump operator's panel DIRECT TANK FILL open indicator to a known good ground.

a. If 22 to 28 VDC are present, replace DIRECT TANK FILL open indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 2315 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

CHECK FOR OPEN COMPARTMENT DOORS WHEN LIGHT IS ON INDICATOR DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test(WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0100
WP 0193
WP 0194

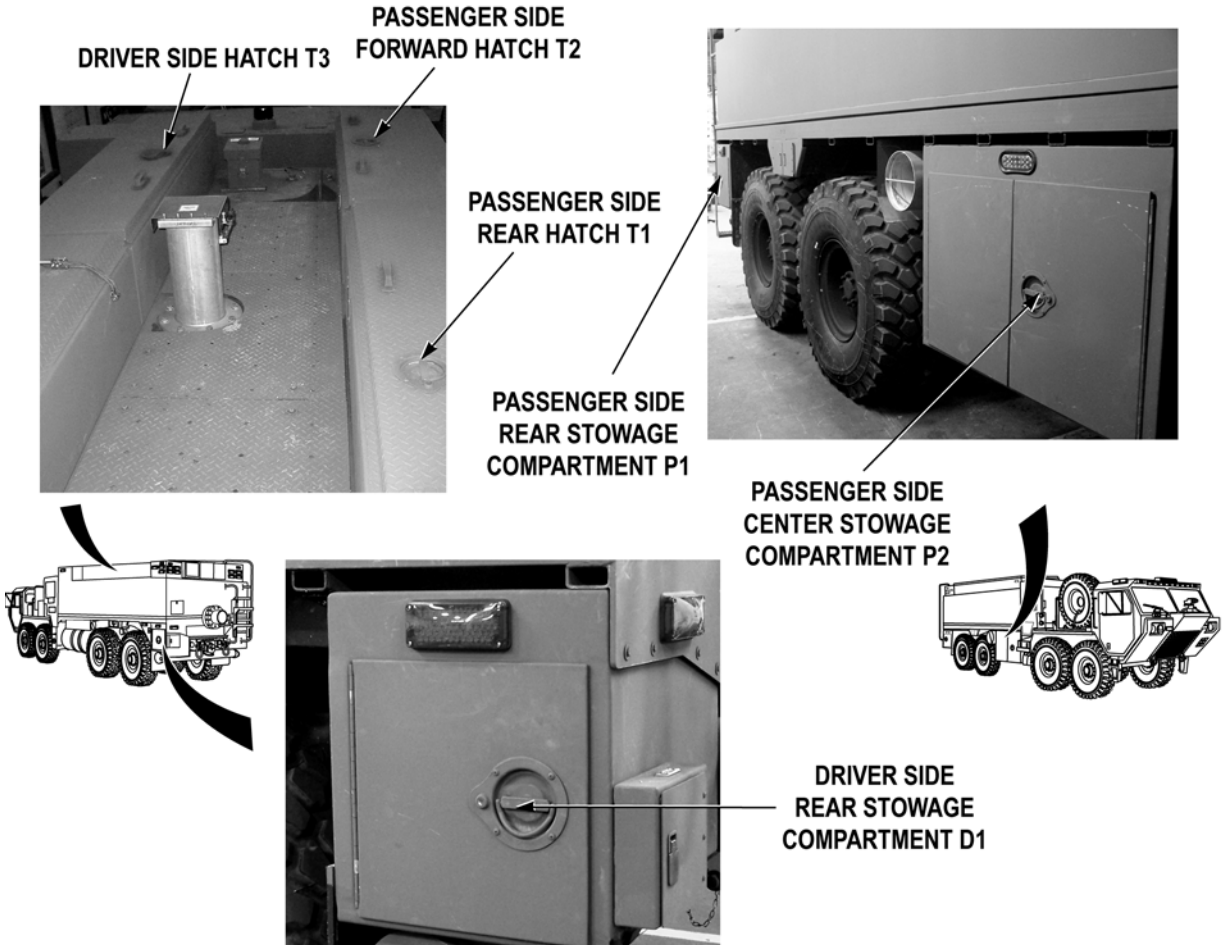
References (continued)
WP 0203
WP 0240
WP 0241
WP 0242
WP 0245
WP 0279
WP 0280
WP 0287
WP 0293
WP 0299

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

CHECK FOR OPEN COMPARTMENT DOORS WHEN LIGHT IS ON INDICATOR DOES NOT OPERATE PROPERLY

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON flasher unit receives power when parking brakes are released or ENGINE switch is in OFF position (TM 9-2320-279-10). Make sure that ENGINE switch is in OFF position while performing checks unless directed otherwise.

Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Open all stowage compartment doors and hatches (WP 0008). Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, go to Step 32.

Step 2. Turn ENGINE switch to ON position (TM 9-2320-279-10). Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator stops flashing.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not stop flashing, go to Step 29.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 3. Close all stowage compartment doors and hatches (WP 0008). Turn ENGINE switch to OFF position (TM 9-2320-279-10). Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes (WP 0004).

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes, go to Step 17.

NOTE

Keep all stowage compartment doors and hatches closed and ENGINE switch in OFF position when performing Steps 4 through 6 except as noted.

Step 4. While an assistant opens and closes passenger side center stowage compartment P2 door (WP 0008), check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes when door is open (WP 0004).

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash when compartment doors are opened, go to Step 15.

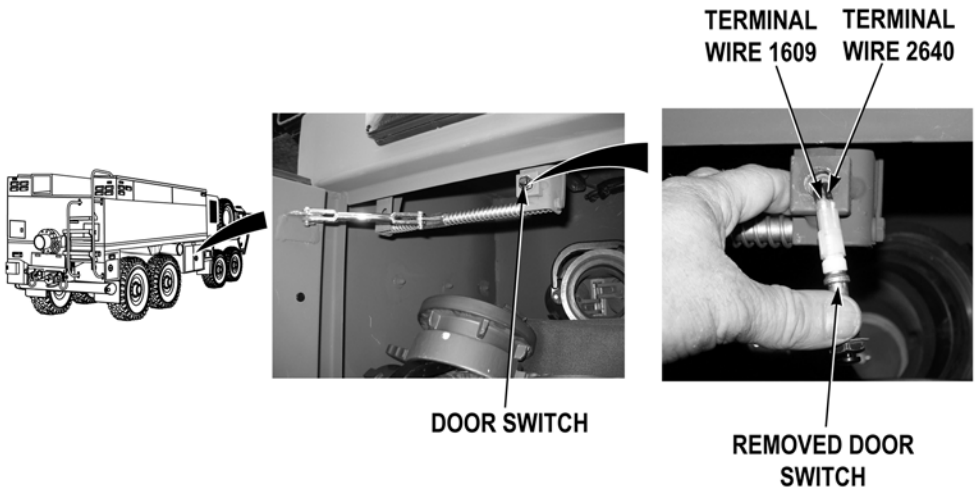
Step 5. While an assistant opens and closes each of following stowage compartment doors one at a time (WP 0008), check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes when door is open (WP 0004). Open passenger side rear stowage compartment P1 door (WP 0008), then close. Open passenger side rear T1 hatch (WP 0008), then close. Open passenger side forward T2 hatch (WP 0008), then close.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash when stowage compartment door is open, go to Step 11.

Step 6. While an assistant opens and closes each following compartment doors one at a time (WP 0008), check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes when door is open (WP 0004). Open driver side top T3 hatch (WP 0008), then close. Open driver side rear stowage compartment D1 door (WP 0008), then close.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes when compartment doors are opened, system is operating properly.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 7. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Close all stowage compartment doors and hatches except non-operating door/hatch (WP 0008). Remove door switch at non-operating door/hatch (WP 0245). Do not disconnect wires. Check for continuity between door switch terminal wire 1609 (gray) and a known good ground when switch is closed (door switch is not pressed).

If there is continuity, go to Step 10.

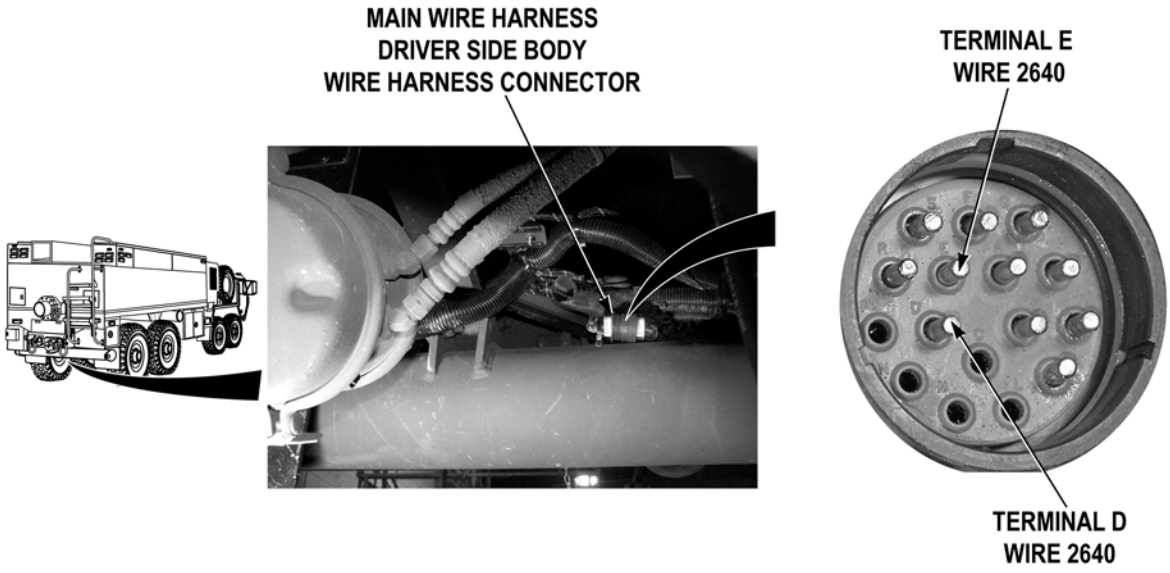
NOTE

If wire 2640 can not be identified at door switch, measure continuity across switch from terminal wire 1609 (gray) to both black wire terminals. Continuity should be measured between all terminals, when switch is closed (door switch is not pressed).

Step 8. Check for continuity across door switch between terminal wire 1609 (gray) and terminal wire 2640 (black) when switch is closed (door switch is not pressed).

If there is no continuity, replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

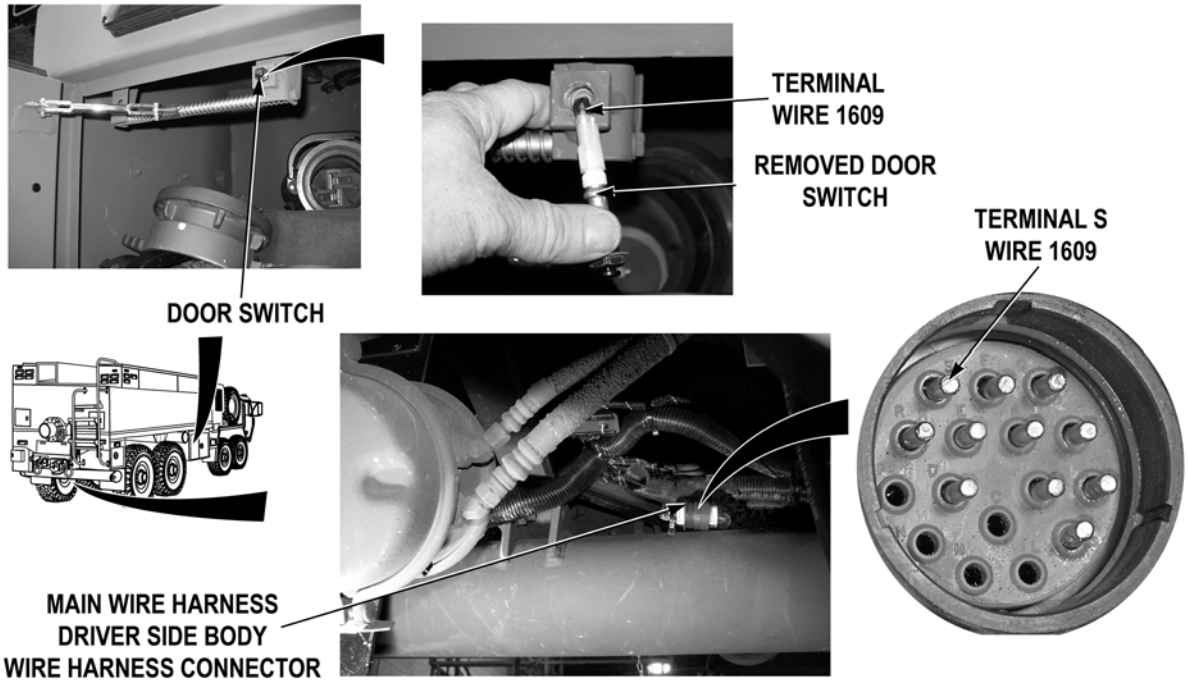


Step 9. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2640 (black) from main wire harness driver side body wire harness connectors, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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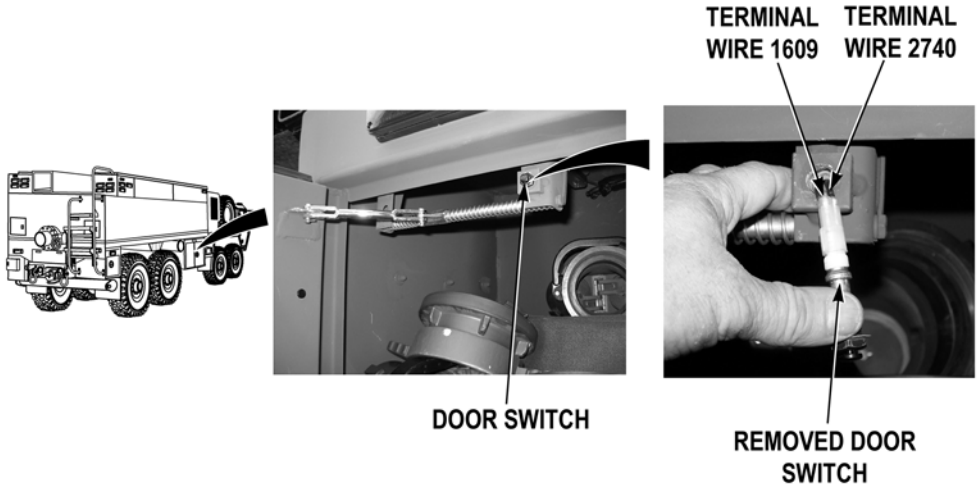
Step 10. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across driver side body wire harness wire 1609 (gray) from driver side body wire harness connector, terminal S to door switch connector terminal.

a. If there is continuity, repair wire 1609 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1609 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 11. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Close all stowage compartment doors and hatches except non-operating door/hatch (WP 0008). Remove door switch at non-operating door/hatch (WP 0245). Do not disconnect wires. Check for continuity between door switch terminal wire 1609 (gray) and a known good ground when switch is closed (door switch is not pressed).

If there is continuity, go to Step 14.

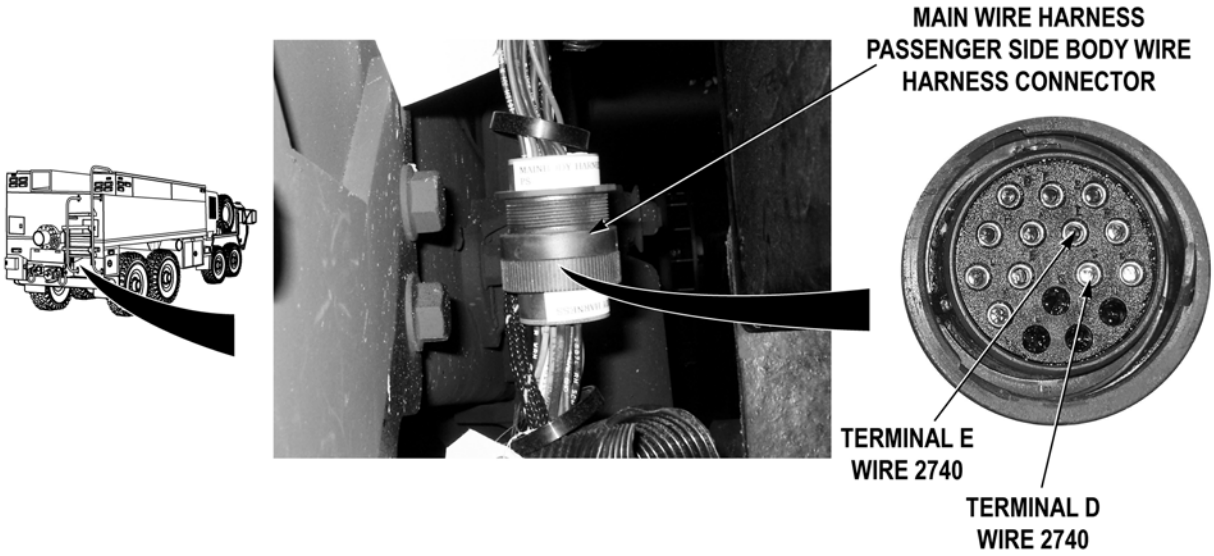
NOTE

If wire 2740 can not be identified at door switch, measure continuity across switch from terminal wire 1609 (gray) to both black wire terminals. Continuity should be measured between all terminals, when switch is closed (door switch is not pressed).

Step 12. Check for continuity across door switch between terminal wire 1609 (gray) and terminal wire 2740 (black).

If there is no continuity, replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

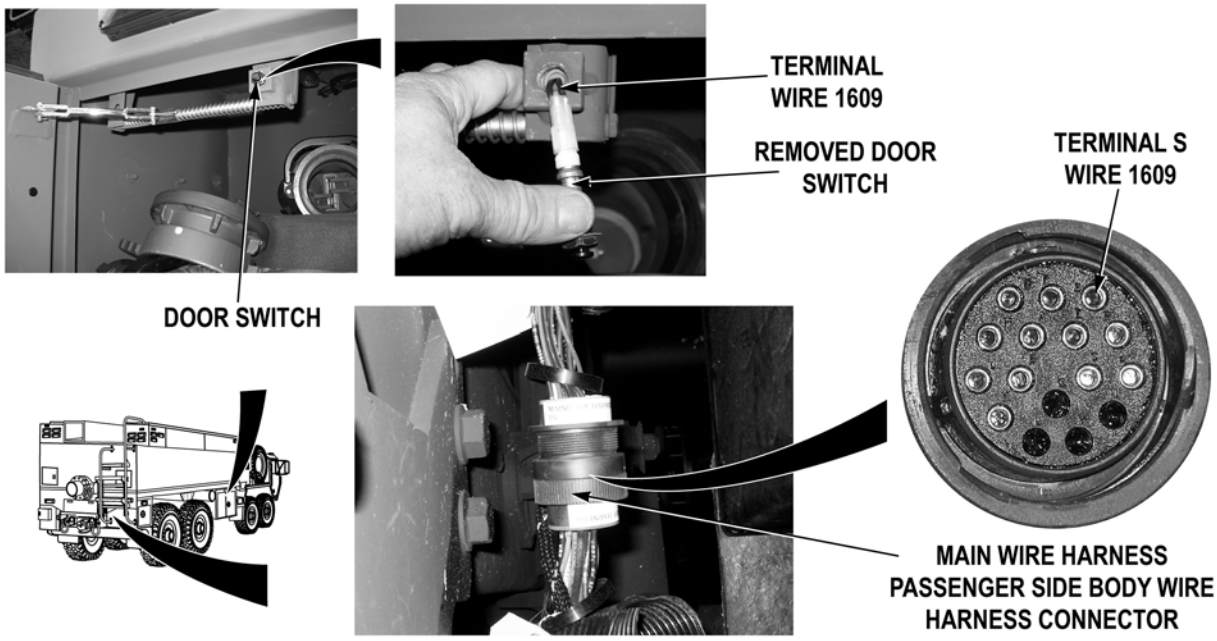


Step 13. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main harness wire 2740 (black) from main wire harness passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

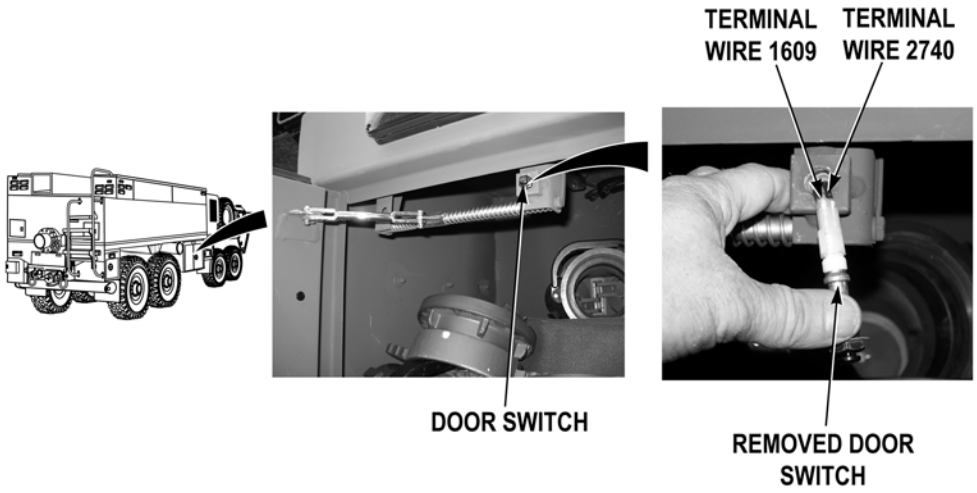
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across passenger side body wire harness wire 1609 (gray) from main wire harness passenger side body wire harness connector, terminal S to door switch connector terminal.

a. If there is continuity, repair wire 1609 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1609 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 15. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Open passenger side center stowage compartment P2 door (WP 0008). Remove door switch at passenger side center stowage compartment P2 (WP 0245). Do not disconnect wires. Check for continuity between door switch terminal wire 1609 (gray) and a known good ground when switch is closed (door switch is not pressed).

If there is continuity, repair wire 1609 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

NOTE

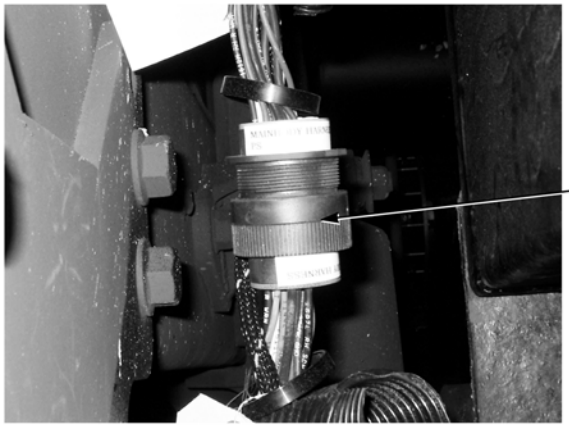
If wire 2740 can not be identified at door switch, measure continuity across switch from terminal wire 1609 (gray) to both black wire terminals. Continuity should be measured between all terminals, when switch is closed (door switch is not pressed).

Step 16. Check for continuity across passenger side center stowage compartment P2 door switch between terminal wire 1609 (gray) and terminal wire 2740 (black).

a. If there is continuity, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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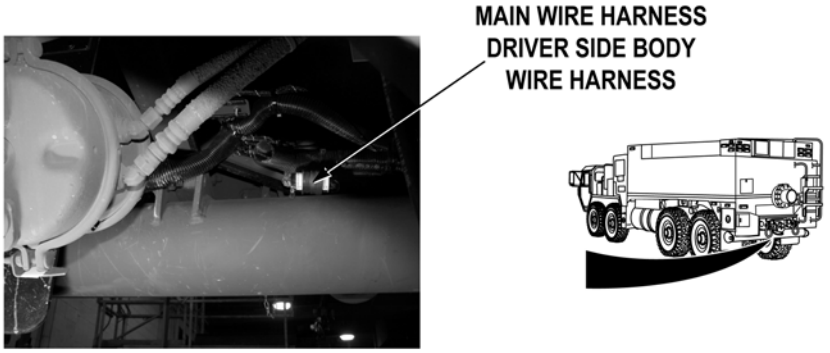
NOTE

- A short to ground is present in system. Steps 17 through 21 will isolate fault to a harness.
- Keep all stowage compartment doors/hatches closed and ENGINE switch in OFF position (TM 9-2320-279-10) when performing these Steps.

Step 17. Disconnect main wire harness passenger side body wire harness connector. Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

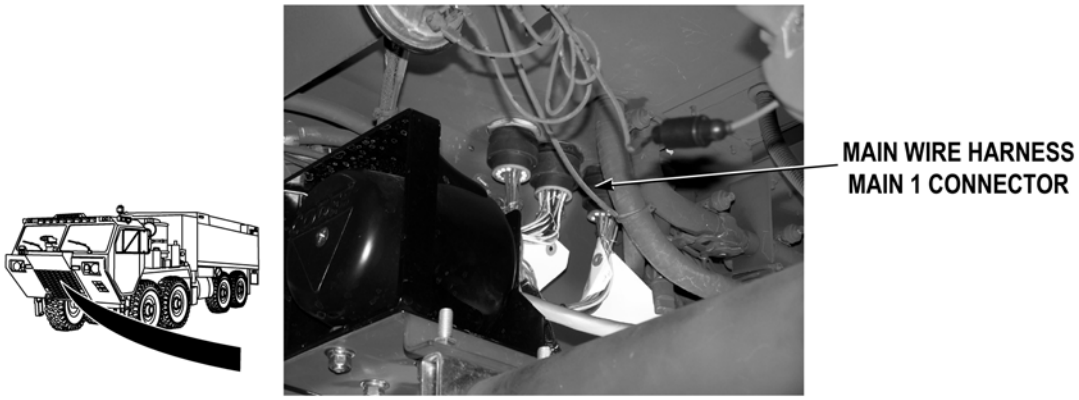
If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, go to Step 25.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Connect main wire harness passenger side body wire harness connector. Disconnect main wire harness driver side body wire harness connector. Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

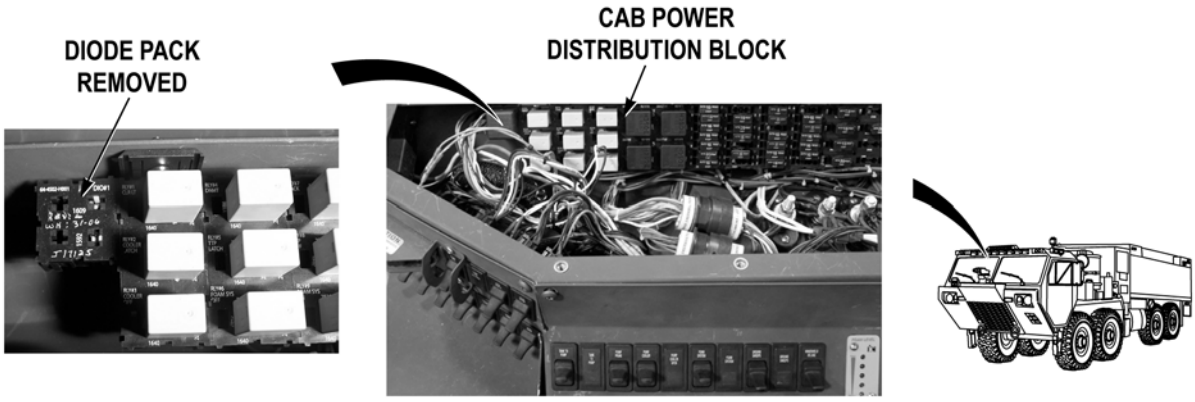
If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, go to Step 23.



Step 19. Connect main wire harness driver side body wire harness connector. Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, go to Step 22.

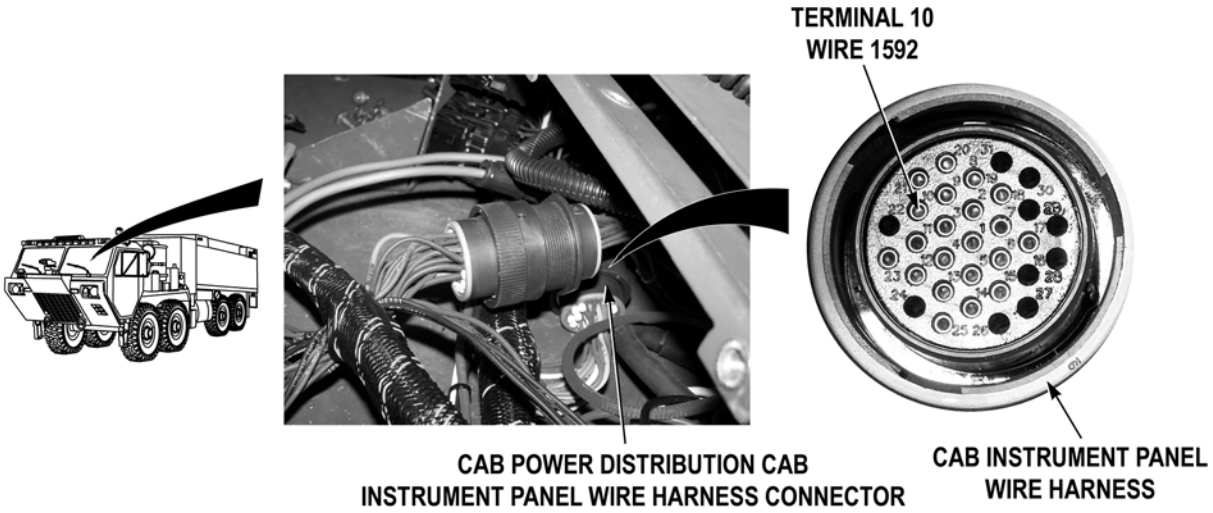
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 20. Remove cab instrument panel A (WP 0203). Remove diode pack (WP 0241). Push battery disconnect switch to on position (WP 0007). Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

a. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, repair wire 1609 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

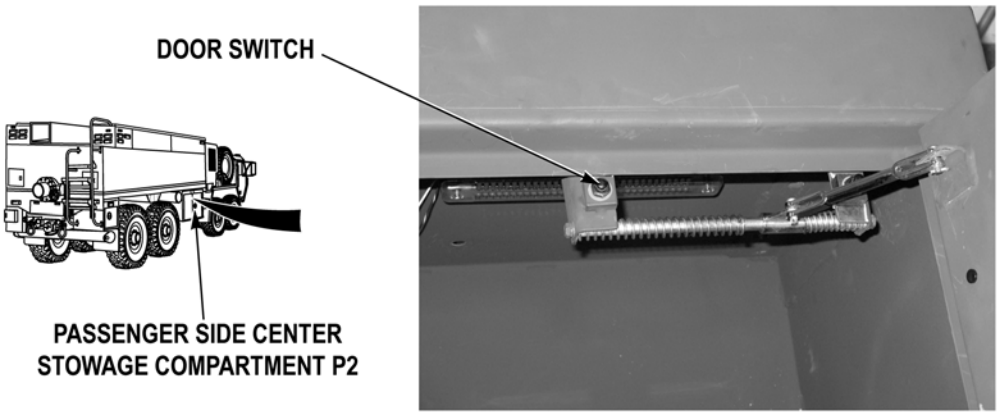


Step 21. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity between cab power distribution wire harness wire 1592 (gray) at cab power distribution wire harness cab instrument panel wire harness connector, terminal 10 and a known good ground.

a. If there is continuity, repair wire 1592 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1592 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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NOTE

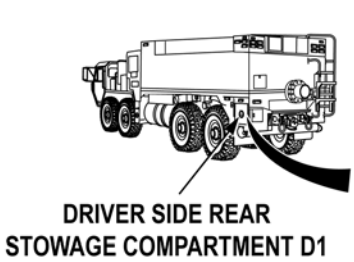
Keep all stowage compartment doors/hatches closed and ENGINE switch if OFF position (TM 9-2320-279-10).

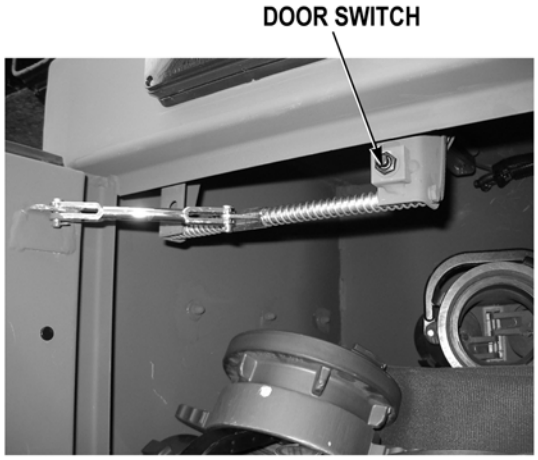
Step 22. Connect main wire harness main 1 connector. Open passenger side center stowage compartment P2 doors (WP 0008). While an assistant pushes passenger side center stowage compartment door switch, check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

a. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, readjust or replace door switch (WP 0245).

b. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes, repair wire 1609 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





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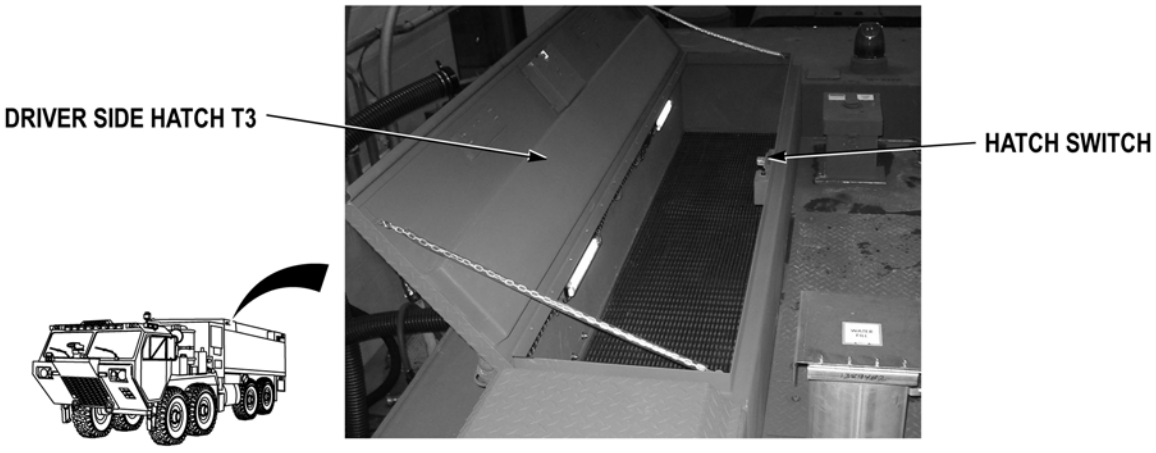
NOTE

- A short to ground is present in system. The following Steps will isolate fault to a door switch or wire.
- Keep all stowage compartment doors/hatches closed and ENGINE switch in OFF position (TM 9-2320-279-10) when performing these Steps except as noted.

Step 23. Connect main wire harness driver side body wire harness connector. Open driver side rear stowage compartment D1 door (WP 0008). While an assistant pushes driver side rear stowage compartment D1 door switch, check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, readjust or replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

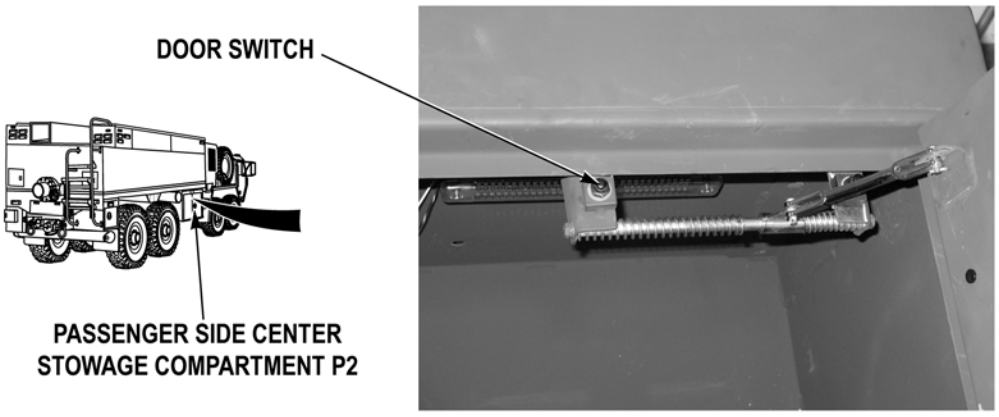


Step 24. Close driver side rear stowage compartment D1 doors (WP 0008). Open driver side T3 hatch (WP 0008). While an assistant pushes driver side T3 hatch switch, check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

a. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, readjust or replace switch (WP 0245).

b. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes, repair wire 1609 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



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Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

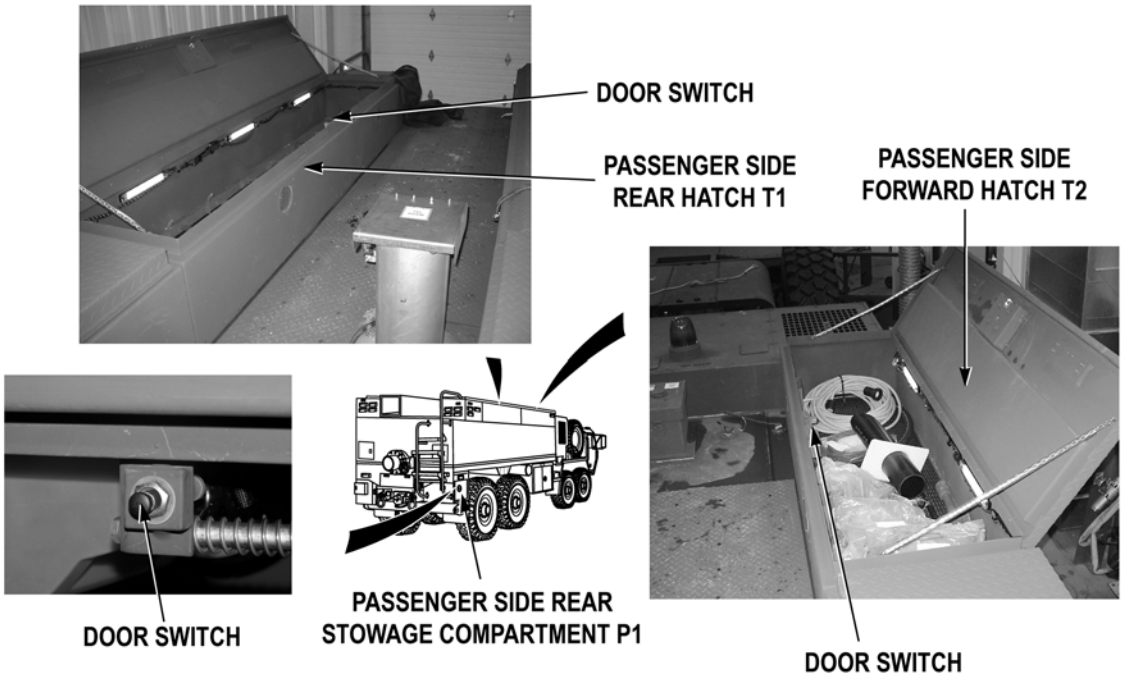
NOTE

- A short to ground is present in system. Steps 25 through 28 will isolate fault to a door switch or wire.
- Keep all stowage compartment doors/hatches closed and ENGINE switch in OFF position (TM 9-2320-279-10) when performing these Steps except as noted.

Step 25. Connect main wire harness passenger side body wire harness connector. Open passenger side center stowage compartment P2 doors (WP 0008). While an assistant pushes passenger side center stowage compartment P2 door switch, check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, readjust or replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 26. Close passenger side center stowage compartment P2 doors (WP 0008). Open passenger side rear stowage compartment P1 doors (WP 0008). While an assistant pushes passenger side rear stowage compartment P1 door switch, check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, readjust or replace switch (WP 0245).

Step 27. Close passenger side rear stowage compartment P1 doors (WP 0008). Open passenger side rear T1 hatch (WP 0008). While an assistant pushes passenger side rear T1 hatch switch, check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

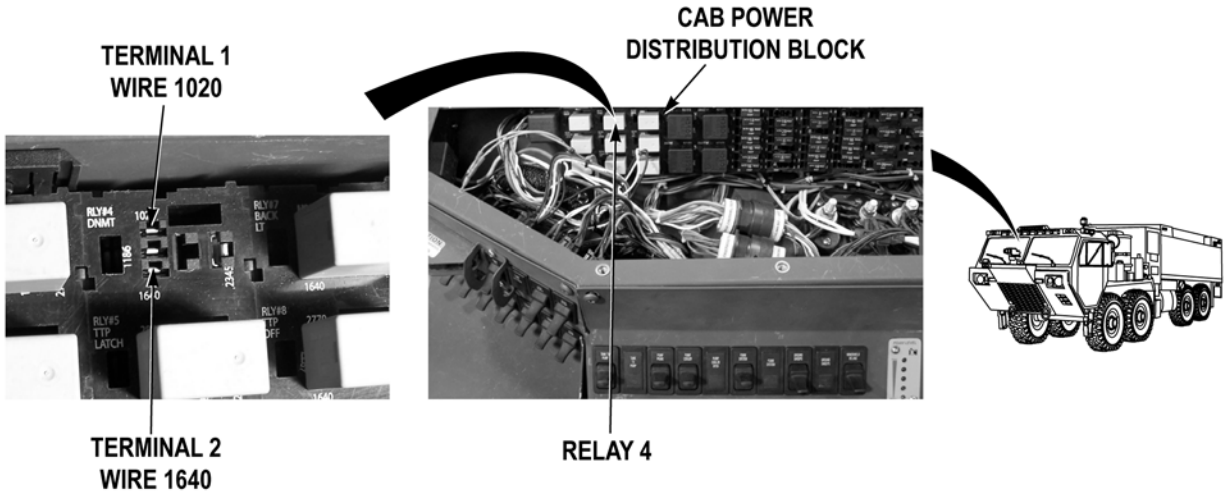
If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, readjust or replace switch (WP 0245).

Step 28. Close passenger side rear T1 hatch (WP 0008). Open passenger side forward T2 hatch (WP 0008). While an assistant pushes passenger side forward hatch T2 switch, check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes.

a. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, readjust or replace switch (WP 0245).

b. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes, repair wire 1609 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 29. Remove cab instrument panel A (WP 0203). Remove relay 4 (WP 0242). Push battery disconnect switch to on position (WP 0007). Turn ENGINE switch to ON position (TM 9-2320-279-10). Check for 22 to 28 VDC between cab power distribution wire harness wire 1020 (pink) at relay 4 connector, terminal 1.

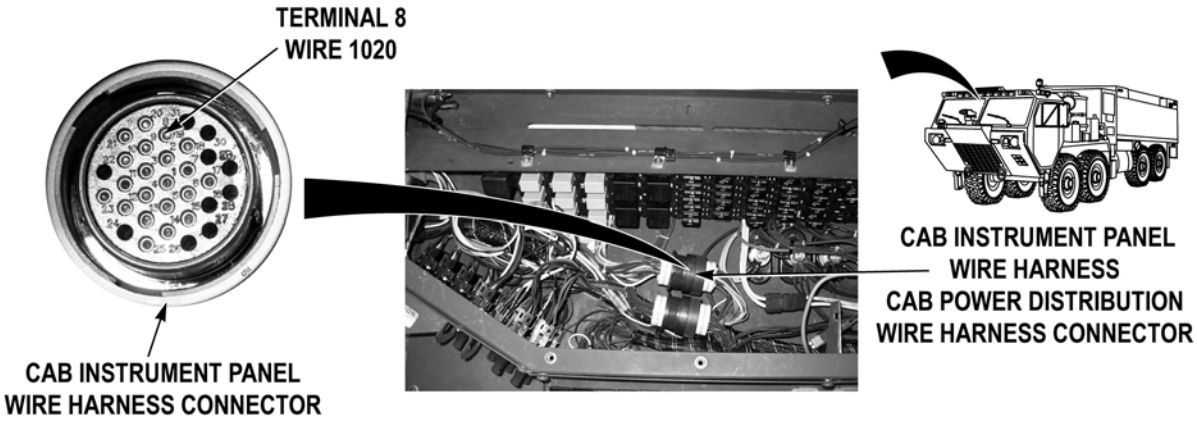
If 22 to 28 VDC are not present, go to Step 31.

Step 30. Turn ENGINE switch to OFF position (TM 9-2320-279-10). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab power distribution wire harness wire 1640 (black) from relay 4 connector, terminal 2 to a known good ground.

a. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

b. If there is continuity, replace relay 4 (WP 0242).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 31. Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire 1020 (pink) at cab instrument panel wire harness cab power distribution wire harness connector, terminal 8 and a known good ground.

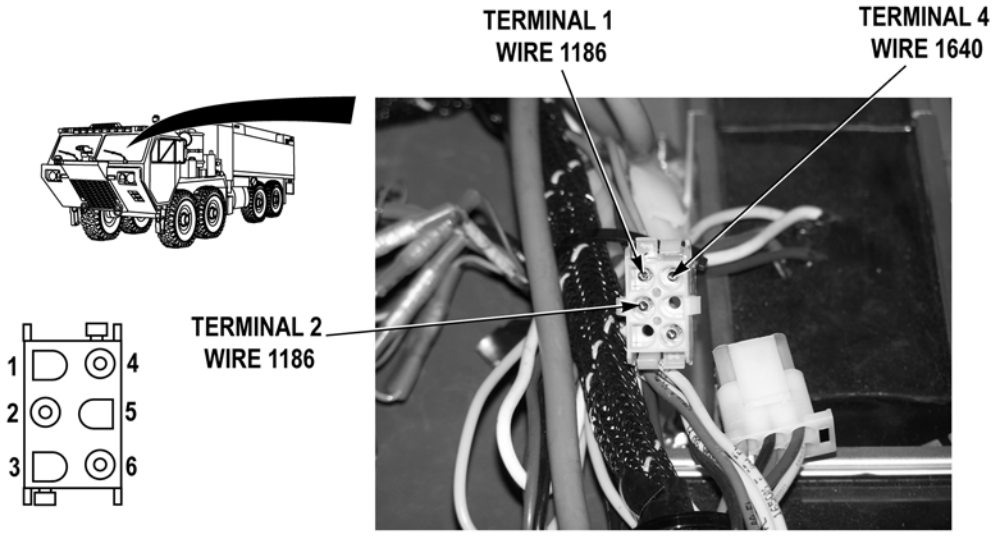
a. If 22 to 28 VDC are present, repair wire 1020 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If 22 to 28 VDC are not present, repair wire 1020 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 32. Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if front and rear lower warning light operates.

If front and rear lower warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0100).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

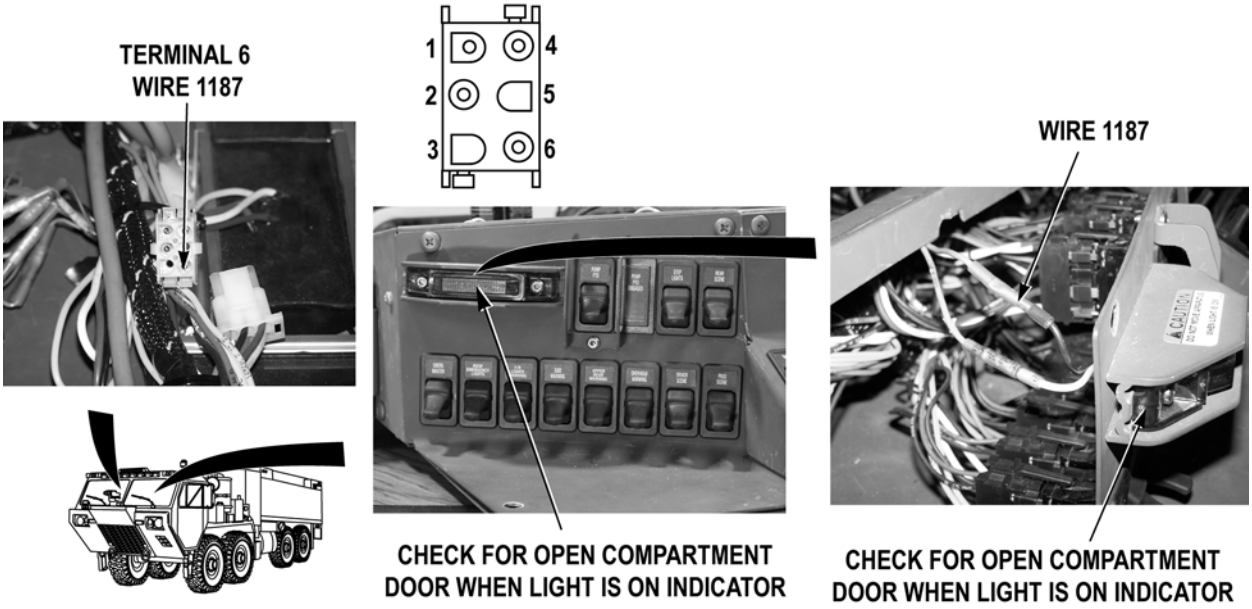
Step 33. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Remove cab instrument panel A (WP 0203). Disconnect cab instrument panel wire harness check for open compartment door when light is on flasher unit connector. Check for 22 to 28 VDC between wire 1186 (gray) at cab instrument panel wire harness check for open compartment door when light is on flasher unit connector, terminals 1 and 2 and a known good ground.

If 22 to 28 VDC are not present, go to Step 42.

Step 34. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across wire 1640 (black) from cab instrument panel wire harness check for open compartment door when light is on flasher unit connector, terminal 4 to a known good ground.

If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

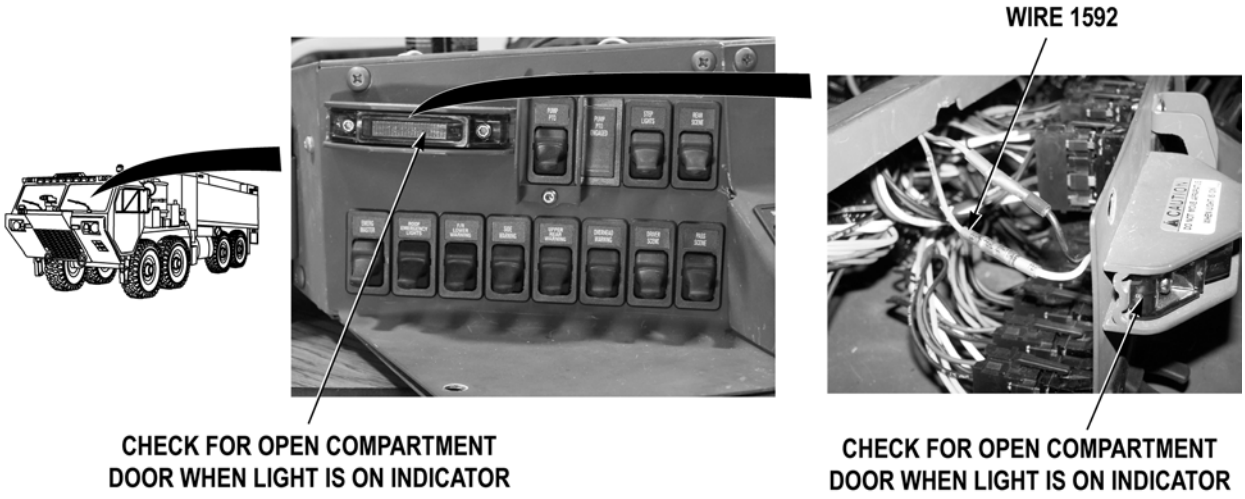
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 35. Remove cab instrument panel C (WP 0203). Cut cab instrument panel wire harness wire 1187 (gray/black) at check for open compartment doors when light is on indicator butt splice connector. Check for continuity across wire 1187 (gray/black) from cab instrument panel wire harness check for open compartment door when light is on flasher unit connector, terminal 6 to cab instrument panel wire harness CHECK FOR OPEN COMPARTMENT WHEN LIGHT IS ON indicator butt splice connector termination.

If there is no continuity, repair wire 1187 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 36. Cut wire 1592 (gray/white) at CHECK FOR OPEN COMPARTMENT WHEN LIGHT IS ON indicator butt splice connector. With rear compartment doors open, check for less than 10 K ohms resistance between wire 1592 (gray/white) at cab instrument panel wire harness CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator butt splice connector termination and a known good ground.

If there is greater than 10 K ohms resistance, go to Step 38.

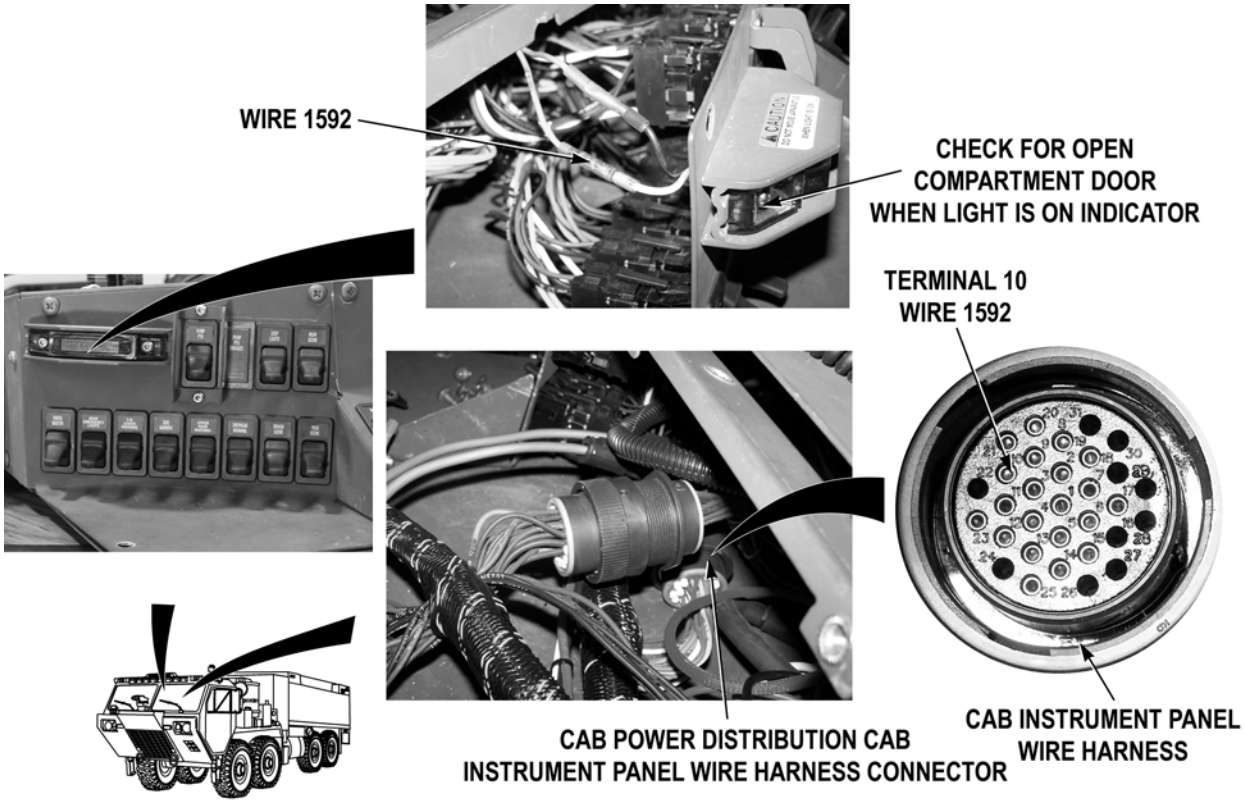
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 37. Repair wire 1592 and wire 1187 at cab instrument panel wire harness CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator (TM 9-2320-315-14&P). Disconnect cab instrument panel wire harness check for open compartment door when light is on flasher unit connector. Disconnect cab instrument panel wire harness side warning light flasher unit connector. Connect cab instrument panel wire harness CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON connector to side warning flasher unit. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check if CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes (WP 0004) when rear compartment doors/hatches are opened.

a. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator does not flash, connect cab instrument panel wire harness flasher unit connectors to original positions and replace CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator (WP 0193).

b. If CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator flashes, connect cab instrument panel wire harness flasher unit connectors to original positions and replace check for open compartment door when light is on flasher unit (WP 0194).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



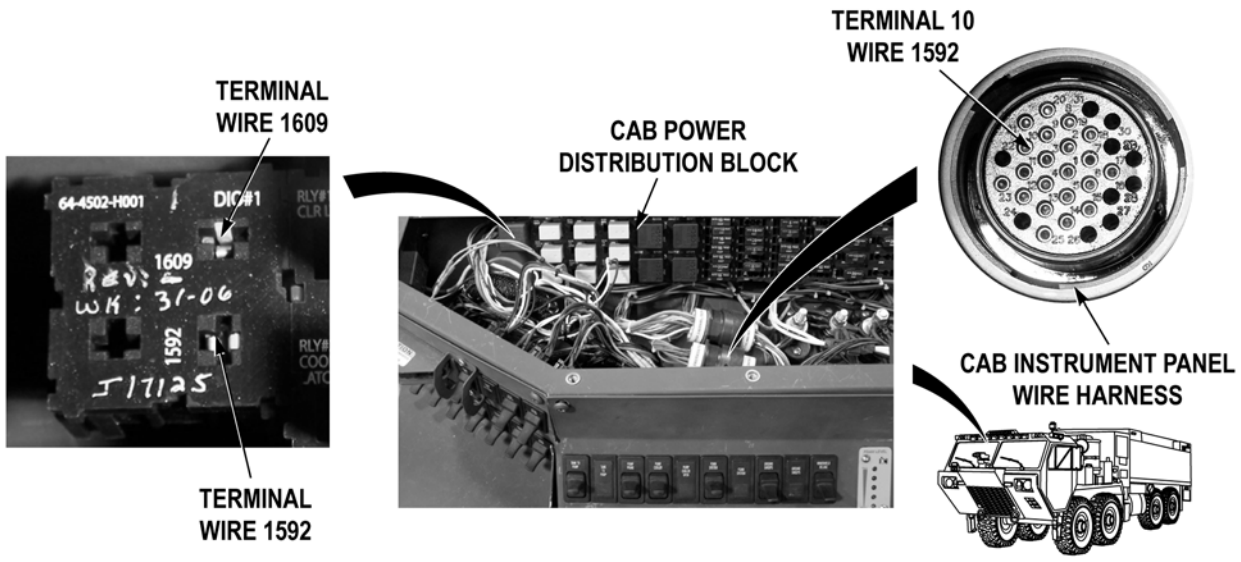
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 38. Disconnect cab instrument panel wire harness cab power distribution wire harness connector. Cut cab instrument panel wire harness wire 1592 (gray or white) at CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator butt splice connector. With a lead test set, check for continuity across cab instrument panel wire harness wire 1592 (gray/white) between CHECK FOR OPEN COMPARTMENT DOOR WHEN LIGHT IS ON indicator termination, wire 1592 (gray/white) and cab instrument panel wire harness connector, terminal 10.

If there is no continuity, repair wire 1592 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



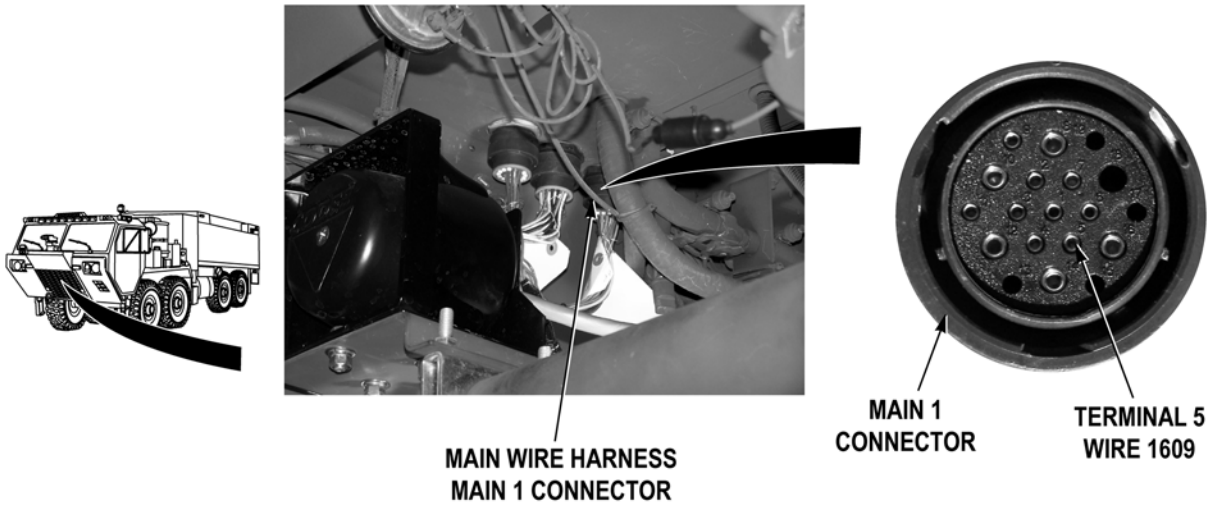
Step 39. Remove diode block from cab power distribution block (WP 0241). Install a jumperwire between diode block terminals wire 1592 (gray) and wire 1609 (gray). With rear compartment doors open, check for continuity between wire 1592 (gray) cab instrument panel wire harness connector, terminal 10 and a known good ground.

If there is continuity, replace diode block (WP 0241).

Step 40. With a test lead set, check for continuity across cab power distribution wire harness wire 1592 (gray) between cab instrument panel wire harness cab power distribution wire harness connector, terminal 10 and diode block connector terminal.

If there is no continuity, repair wire 1592 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

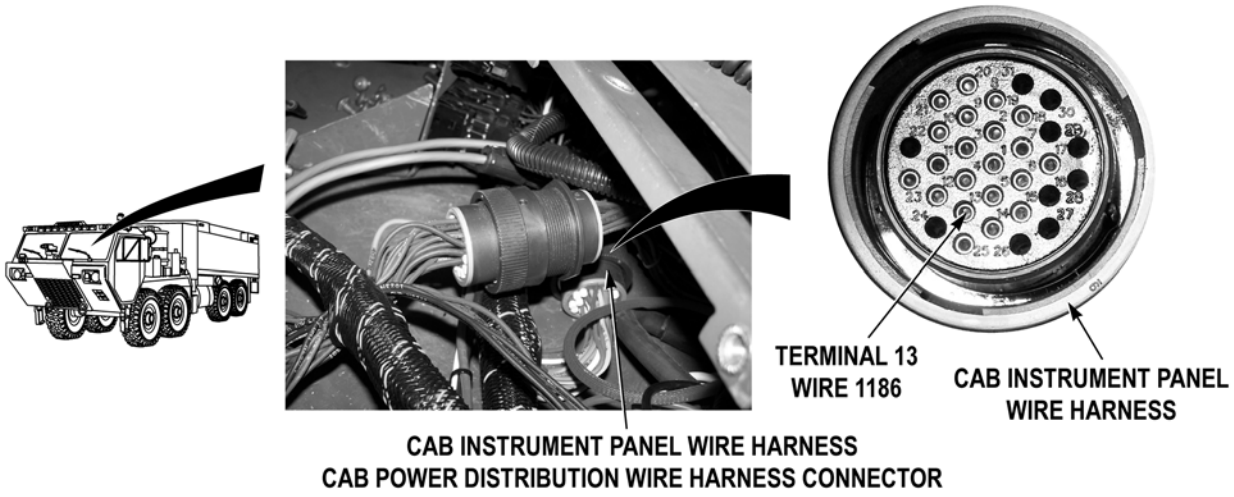


Step 41. Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With rear compartment doors open and with a lead test set, check for continuity between wire 1609 (gray) at main wire harness main 1 connector, terminal 5 and a known good ground.

a. If there is continuity, repair wire 1609 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

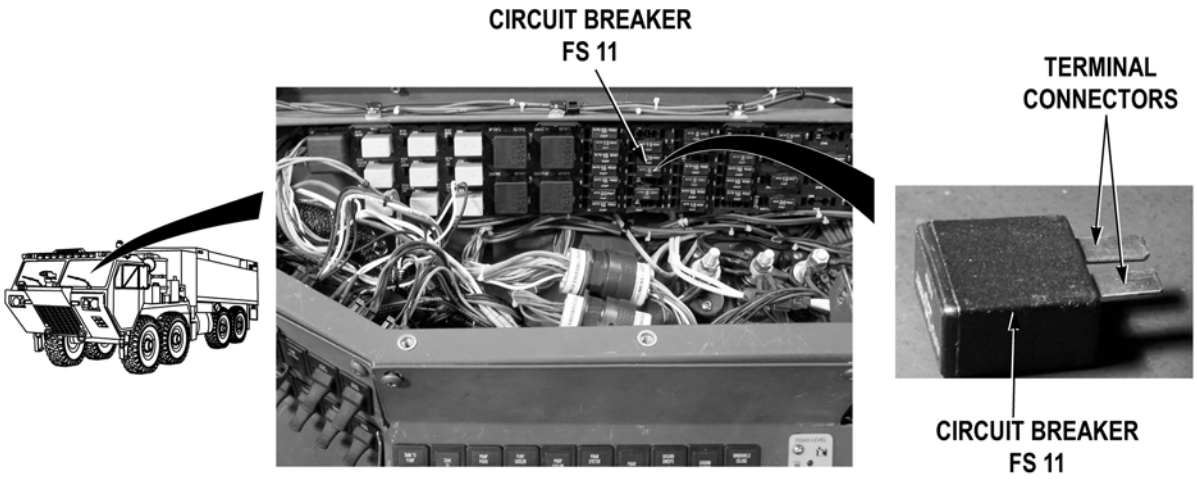
b. If there is no continuity, repair wire 1609 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 42. Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a lead test set, check for 22 to 28 VDC between wire 1186 (gray) at cab instrument panel wire harness cab power distribution wire harness connector, terminal 13 and a known good ground.

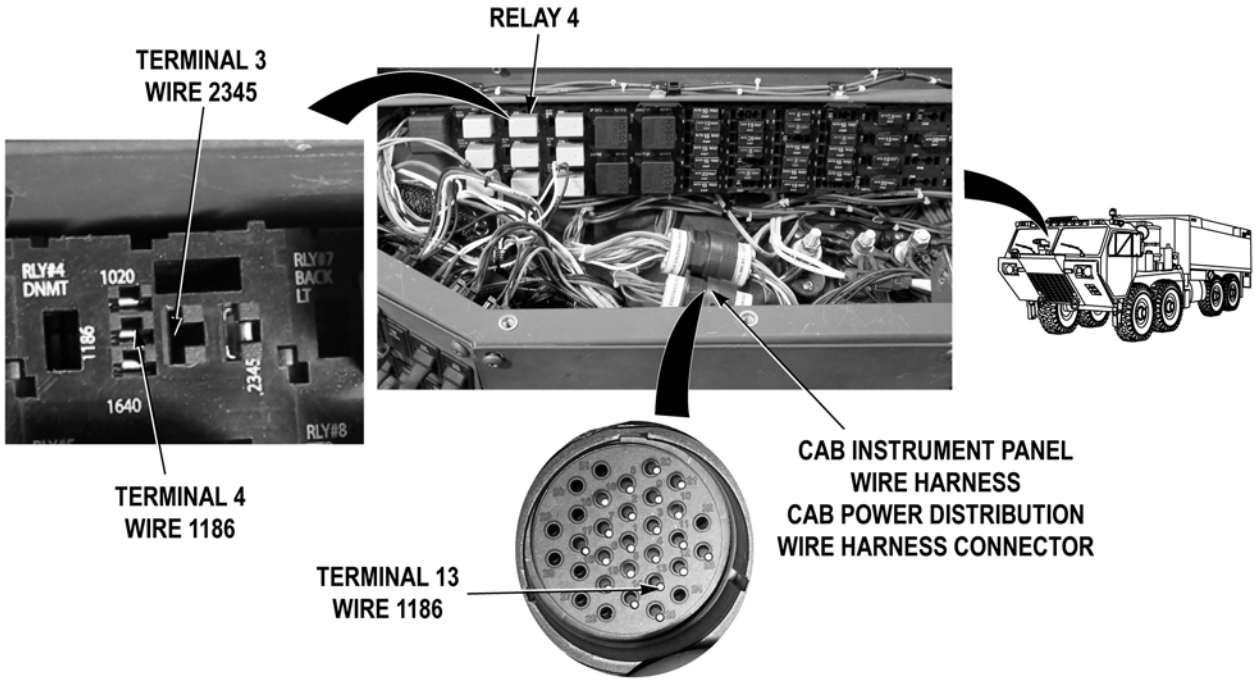
If 22 to 28 VDC are present, repair wire 1186 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).



Step 43. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove circuit breaker FS 11 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 11 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 44. Install circuit breaker FS 11 (WP 0240). Remove relay 4 (WP 0242). With a test lead set, check for continuity across cab power distribution wire harness wire 1186 (gray) from relay 4 connector, terminal 4 to cab instrument panel wire harness cab power distribution wire harness connector, terminal 13.

If there is no continuity, repair wire 1186 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280)

Step 45. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between wire 2345 (red) at cab power distribution wire harness relay 4 connector, terminal 3 and a known good ground.

a. If there is continuity, replace relay 4 (WP 0242).

b. If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM FLUSH INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0060
WP 0205

References (continued)
WP 0211
WP 0212
WP 0304
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

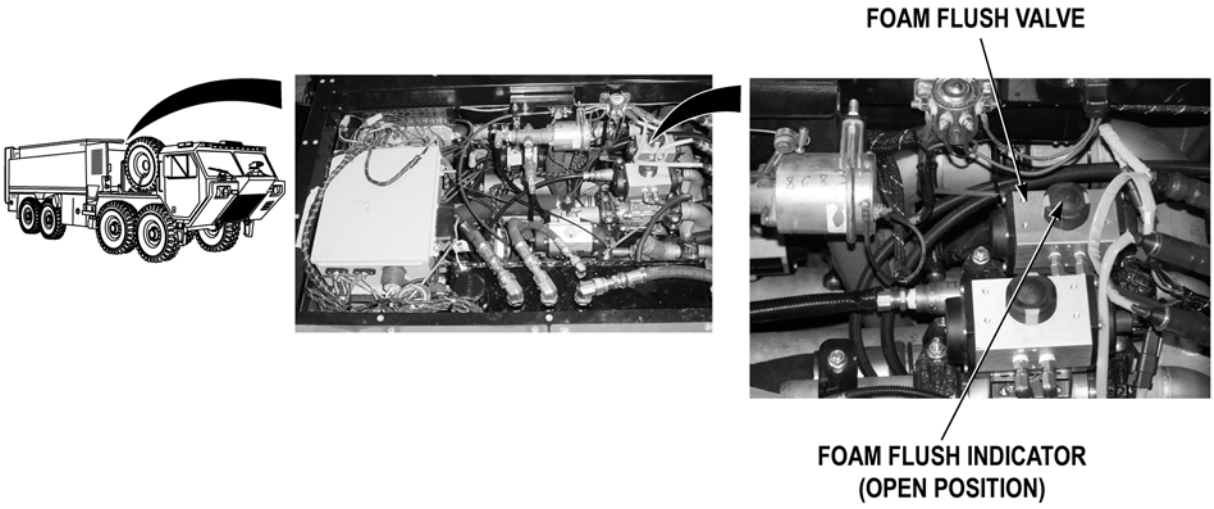
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

FOAM FLUSH INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) when operating foam flush valve during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure. Valve operation can be checked without pump operation.
- Valve operations can be checked by observing valve shaft rotation.
- Step 1 will ensure that foam flush system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

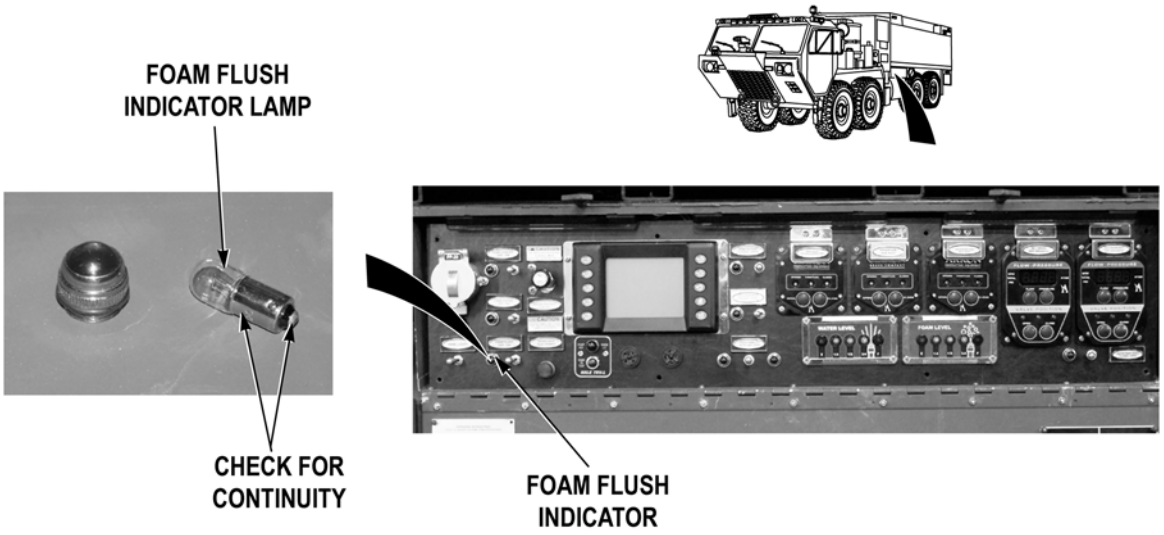
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Open pump house panel K (WP 0341). While an assistant puts pump operator's panel FOAM FLUSH switch to ON position (WP 0004), check if foam flush valve operates to open position.

If foam flush valve does not operate to open position, troubleshoot Foam System Cannot Be Flushed (WP 0060).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



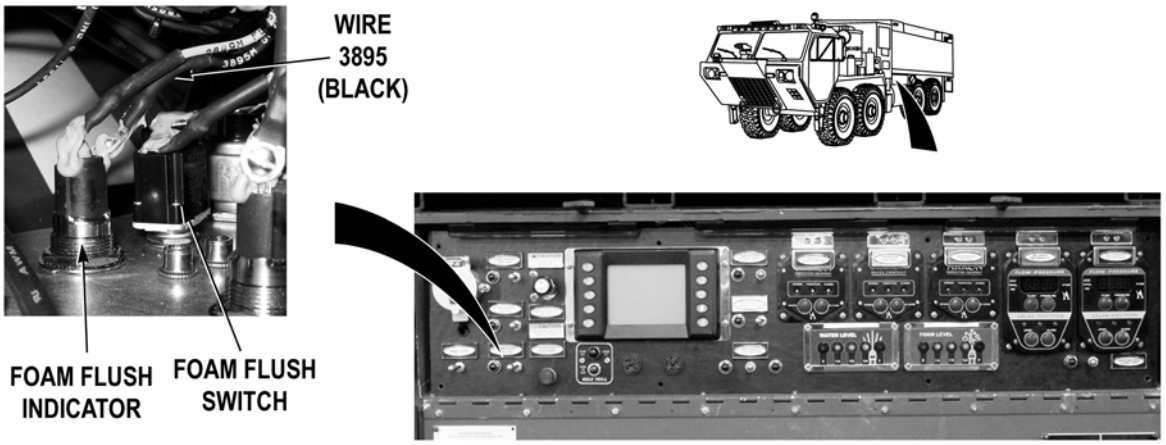
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 2. Put pump operator's panel FOAM FLUSH switch to OFF position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel FOAM FLUSH indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace lamp (WP 0212).

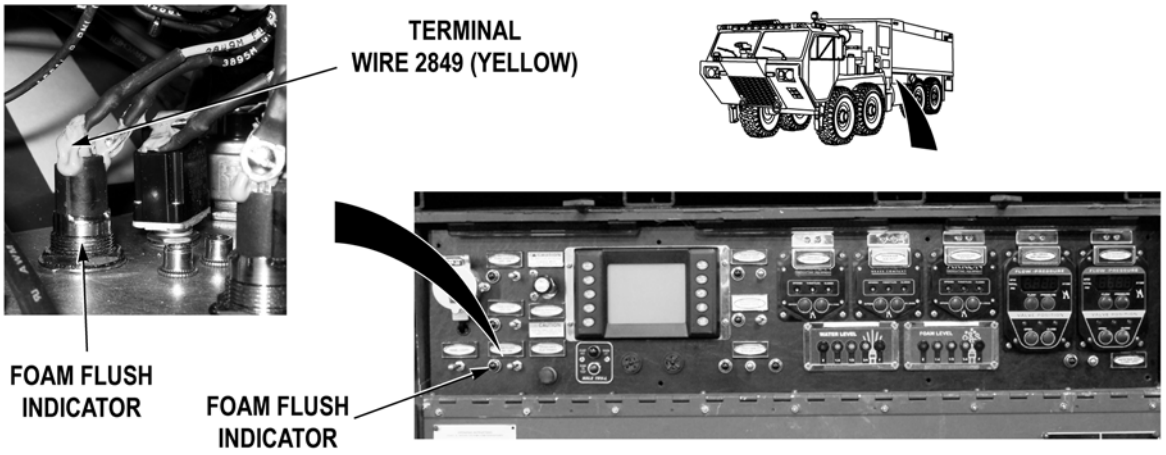
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Install lamp in pump operator's panel FOAM FLUSH indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel FOAM FLUSH indicator to a known good ground.

a. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2849 (yellow) from pump operator's panel FOAM FLUSH indicator to a known good ground.

a. If 22 to 28 VDC are present, replace pump operator's panel FOAM FLUSH indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 2849 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM SYSTEM INDICATOR DOES NOT ILLUMINATE (CAB)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

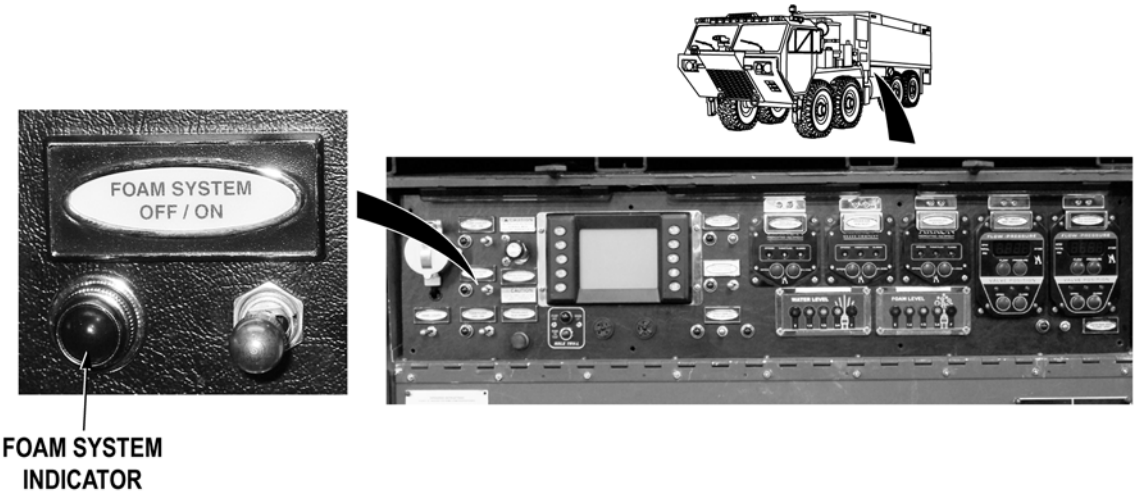
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0056

References (continued)
WP 0196
WP 0203
WP 0281

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

FOAM SYSTEM INDICATOR DOES NOT ILLUMINATE (CAB)



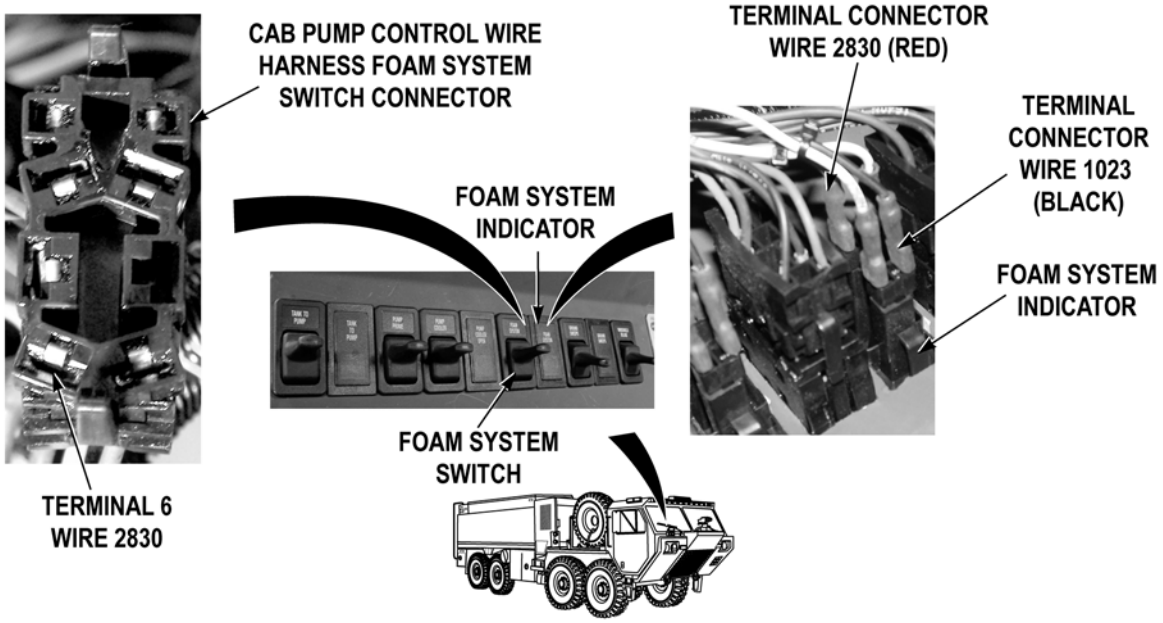
NOTE

Step 1 will ensure that foam system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

Step 1. Push battery disconnect switch to on position (WP 0007). Put cab FOAM SYSTEM switch to on position (WP 0004) and release. Check if pump operator's panel FOAM SYSTEM indicator illuminates.

If pump operator's panel FOAM SYSTEM indicator does not illuminate, troubleshoot Foam Not Delivered From All Systems (Bumper Turret, Under Truck Nozzles, and Manual Metering Controls) or System Does Not Shut Off (WP 0056).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

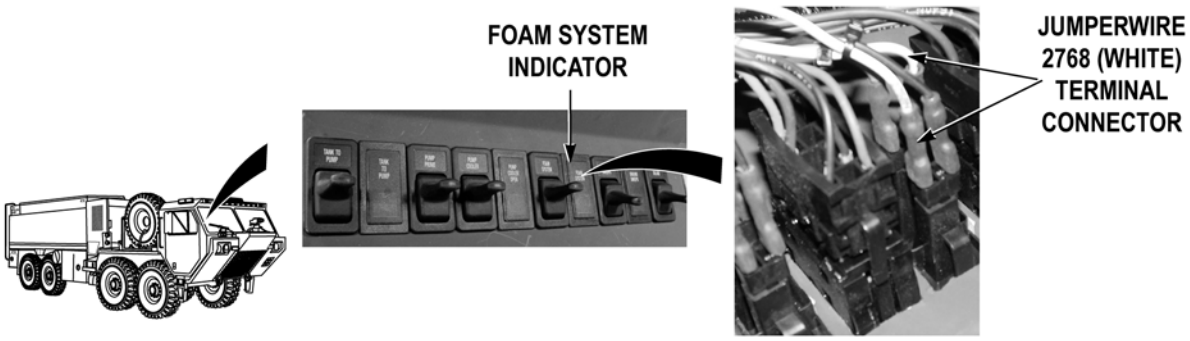
Step 2. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness FOAM SYSTEM switch connector. Disconnect cab pump control wire harness FOAM SYSTEM indicator wire 2830 (red) from FOAM SYSTEM indicator. Check for continuity across cab pump control wire harness wire 2830 (red) from FOAM SYSTEM switch connector, terminal 6 to FOAM SYSTEM indicator terminal connector.

If there is no continuity, repair wire 2830 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

Step 3. Disconnect cab pump control wire harness FOAM SYSTEM indicator wire 1023 (black). Check for continuity across cab pump control wire harness wire 1023 (black) from FOAM SYSTEM indicator connector to a known good ground.

If there is no continuity, repair wire 1023 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Disconnect jumperwire 2768 (white) from FOAM SYSTEM indicator from both terminal connectors. Check for continuity across jumperwire 2768 (white) from terminal to terminal.

a. If there is continuity, replace FOAM SYSTEM indicator (WP 0196).

b. If there is no continuity, repair or replace jumperwire 2768 (white) (TM 9-2320-315-14&P).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

FOAM SYSTEM INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

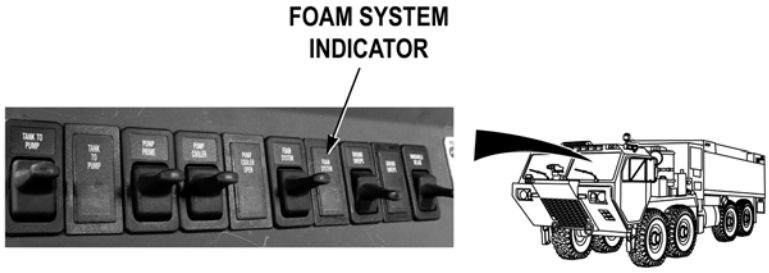
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0056
WP 0205

References (continued)
WP 0211
WP 0212
WP 0304

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

FOAM SYSTEM INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)



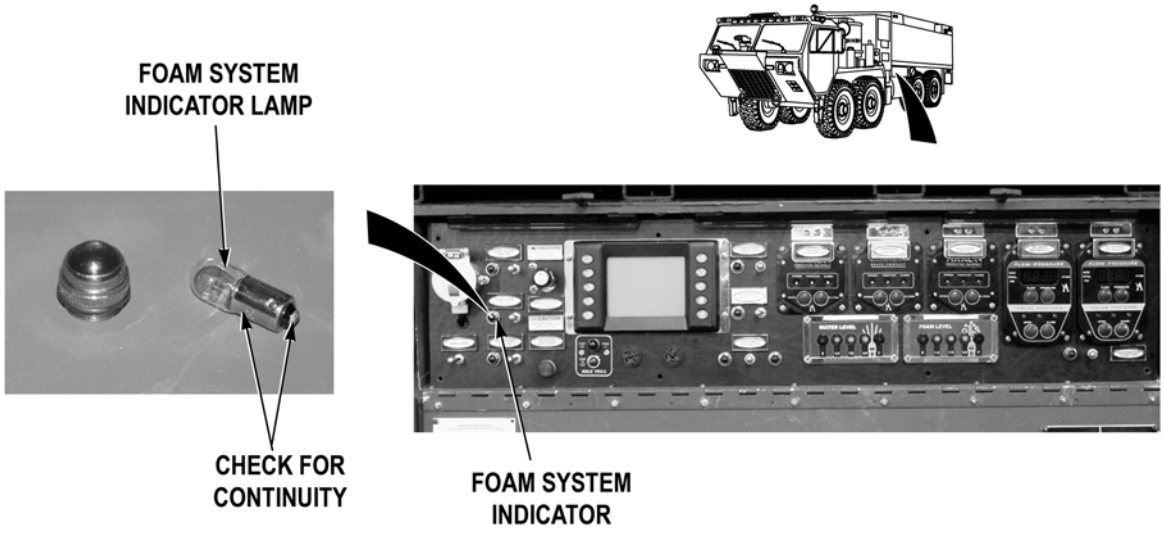
NOTE

Step 1 will ensure that foam system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

Step 1. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel FOAM SYSTEM switch to ON position (WP 0004). Check if cab FOAM SYSTEM indicator illuminates.

If cab FOAM SYSTEM indicator does not illuminate, troubleshoot Foam Not Delivered From All Systems (Bumper Turret, Under Truck Nozzles, and Manual Metering Controls) or System Does Not Shut Off (WP 0056).

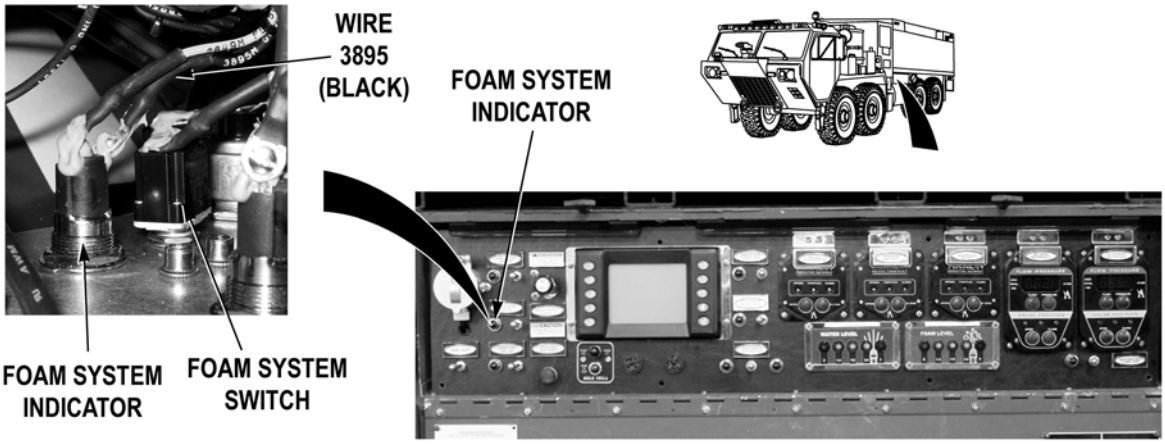
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel FOAM SYSTEM indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace FOAM SYSTEM indicator lamp (WP 0212).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



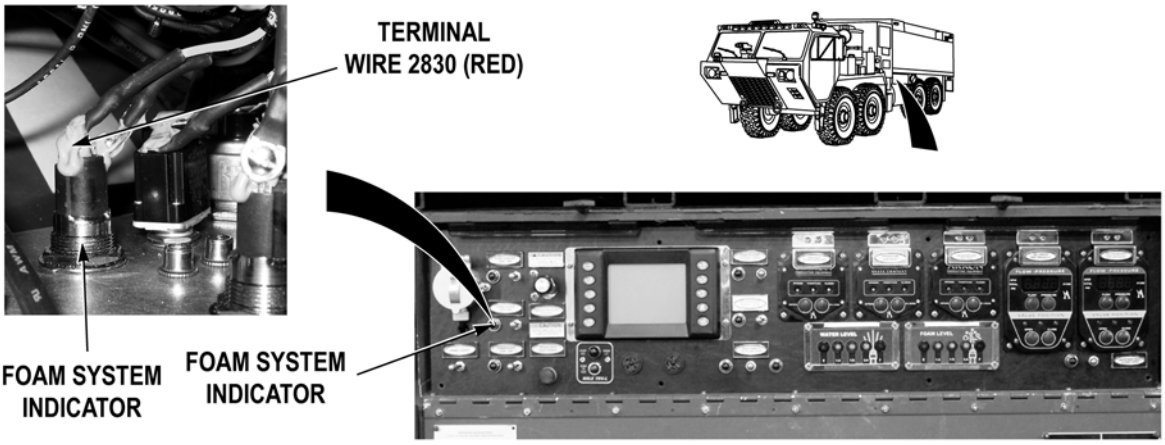
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Install lamp in pump operator's panel FOAM SYSTEM indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel wire harness FOAM SYSTEM indicator terminal to a known good ground.

If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel FOAM SYSTEM switch to ON position (WP 0004). Check for 22 to 28 VDC between wire 2830 (red) at pump operator's panel FOAM SYSTEM indicator terminal and a known good ground.

a. If 22 to 28 VDC are present, replace FOAM SYSTEM indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 2830 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

HOSE REEL DISCHARGE VALVE INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0066

References (continued)
WP 0205
WP 0211
WP 0212
WP 0304
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

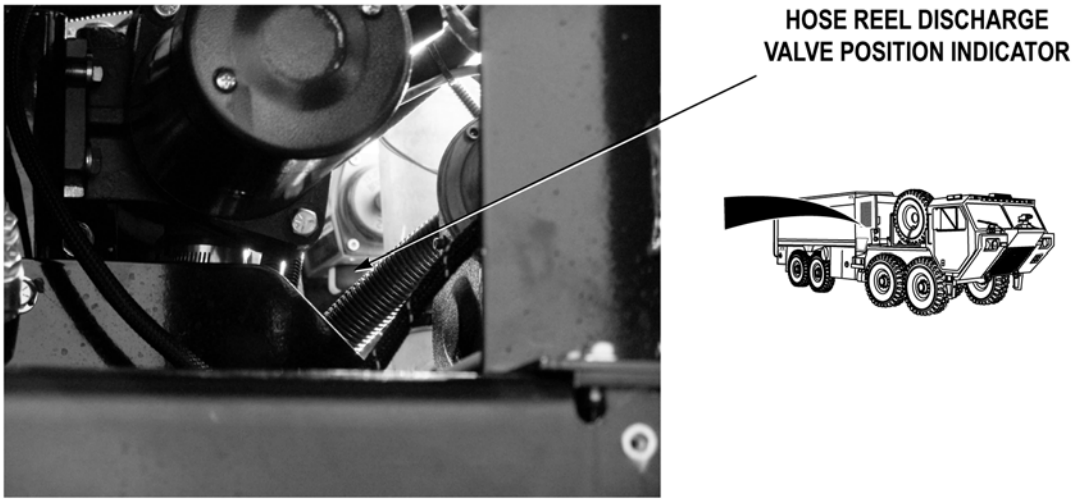
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HOSE REEL DISCHARGE VALVE INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) when operating hose reel discharge valve during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure. Valve operation can be checked without water pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.
- Step 1 will ensure that hose reel discharge system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

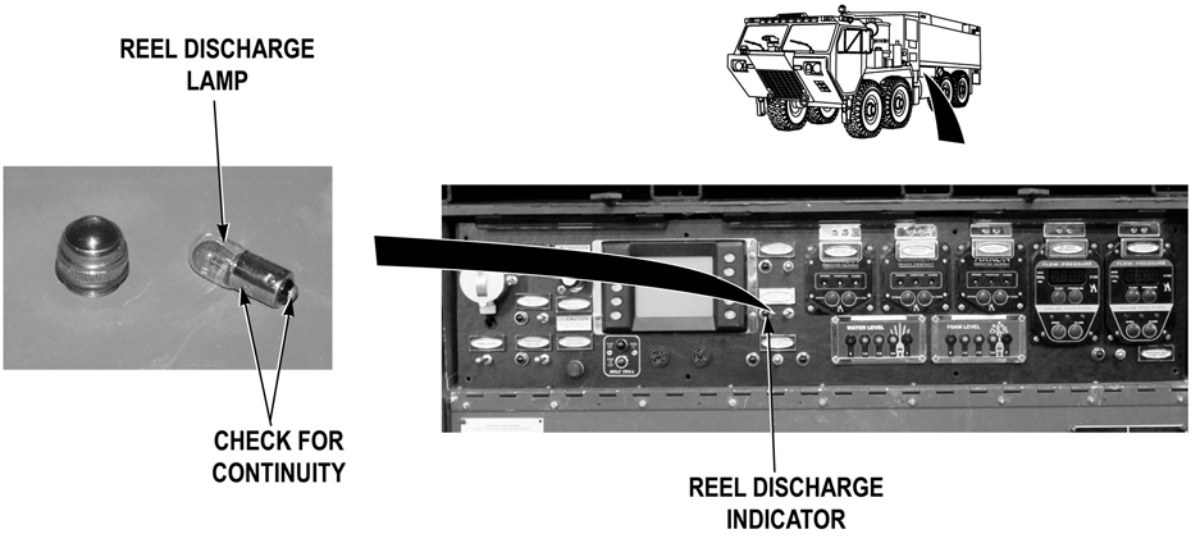
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Remove pump house panel H (WP 0341). While an assistant puts pump operator's panel REEL DISCHARGE switch to OPEN position (WP 0004), check if hose reel discharge valve operates to open position.

If hose reel discharge valve does not operate to open position, troubleshoot Hose Reel Discharge Valve Does Not Operate When Selected (WP 0066).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



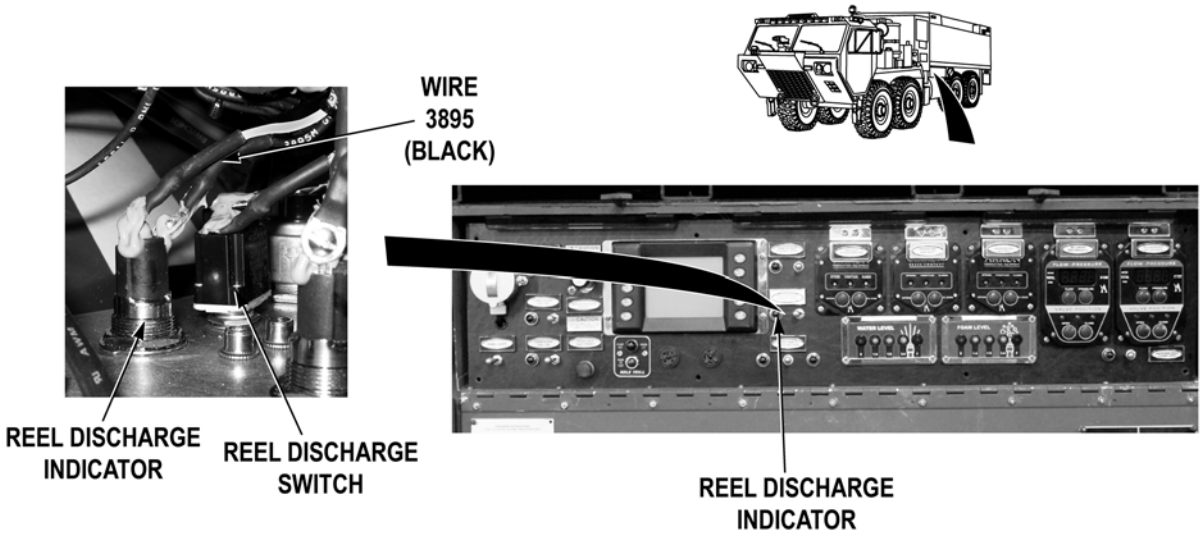
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 2. Put pump operator's panel REEL DISCHARGE switch to CLOSED position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel REEL DISCHARGE indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace lamp (WP 0212).

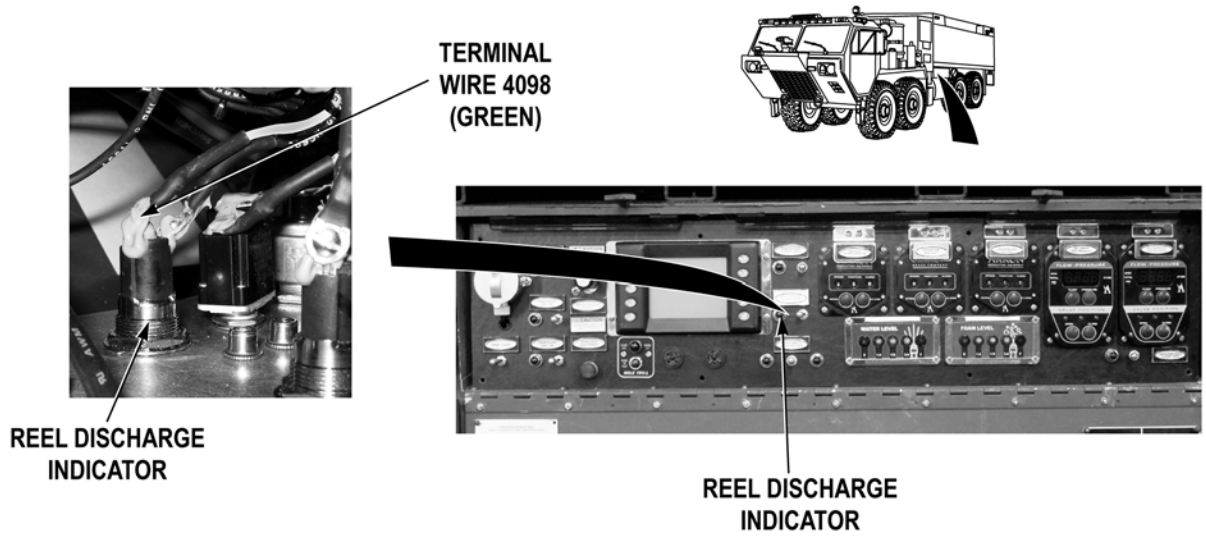
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Install lamp in pump operator's panel REEL DISCHARGE indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel REEL DISCHARGE indicator to a known good ground.

If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel REEL DISCHARGE switch to OPEN position (WP 0004). Check for 22 to 28 VDC between wire 4098 (green) at pump operator's panel wire harness REEL DISCHARGE indicator terminal and a known good ground.

a. If 22 to 28 VDC are present, replace REEL DISCHARGE indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 4098 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP COOLER INDICATOR DOES NOT ILLUMINATE (CAB)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(WP 0399, Item 17)

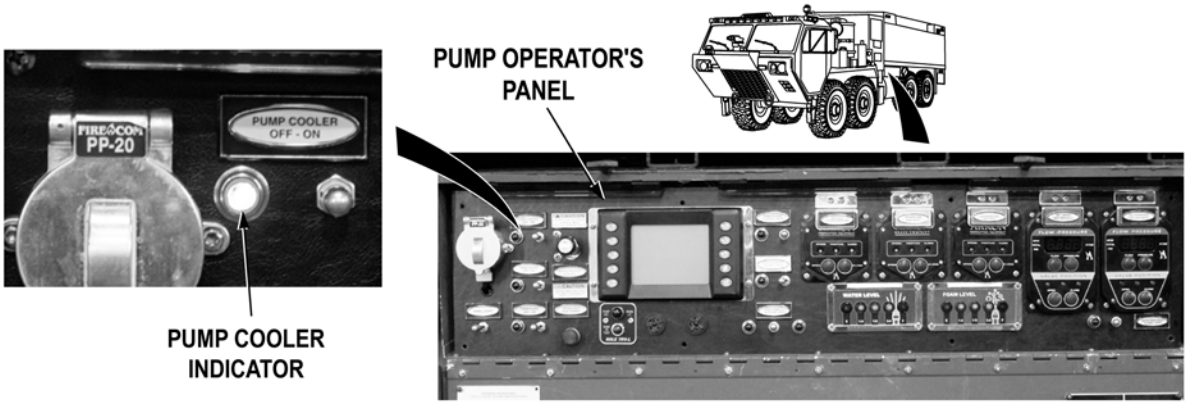
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0070

References (continued)
WP 0196
WP 0203
WP 0281

Equipment Conditions
Cab instrument panel B removed (WP 0203)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PUMP COOLER INDICATOR DOES NOT ILLUMINATE (CAB)



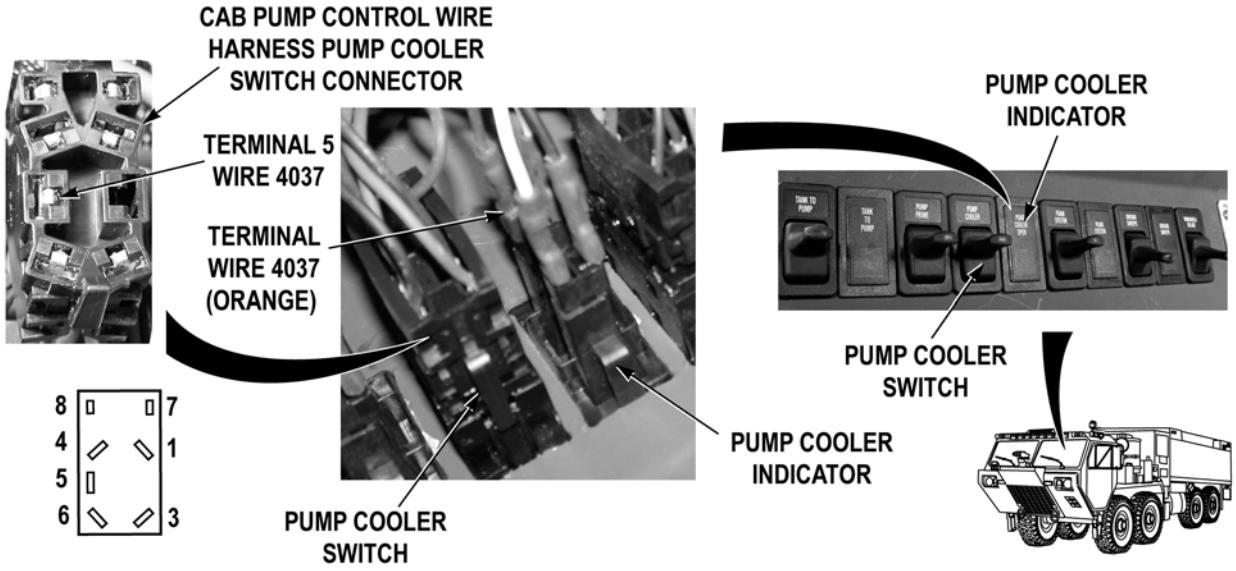
NOTE

Step 1 will ensure that pump cooler system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

Step 1. Push battery disconnect switch to on position (WP 0007). Put cab PUMP COOLER switch to on position (WP 0004). Check if pump operator's panel PUMP COOLER indicator illuminates (WP 0004).

If pump operator's panel PUMP COOLER indicator does not illuminate, troubleshoot Pump Cooler Valve Does Not Operate Properly (WP 0070).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



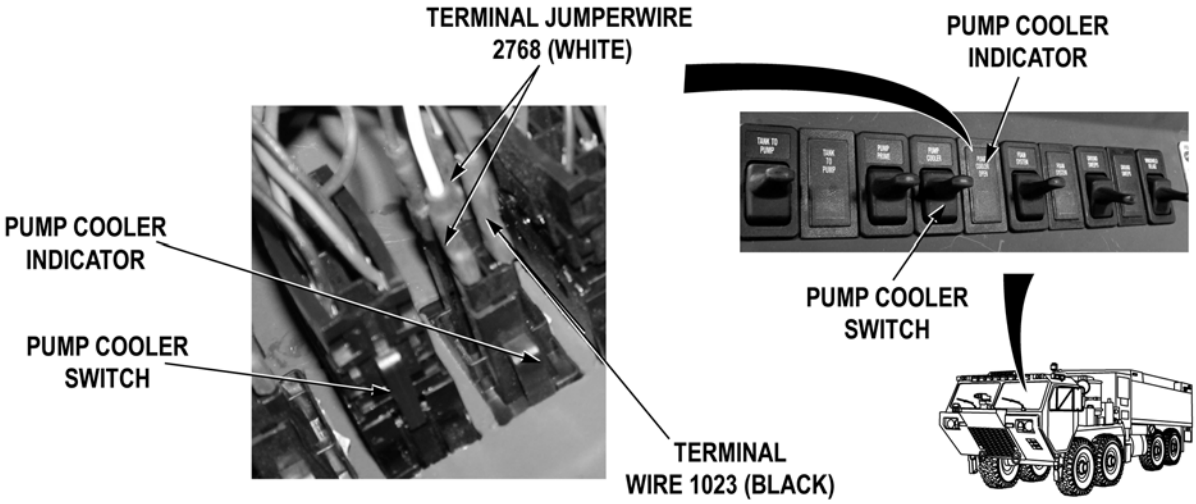
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 2. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness PUMP COOLER switch connector. Check for continuity across cab pump control wire harness wire 4037 (orange) from PUMP COOLER switch connector, terminal 6 to PUMP COOLER indicator terminal connector.

If there is no continuity, repair wire 4037 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Check for continuity across cab pump control wire harness wire 1023 (black) from PUMP COOLER indicator terminal connector to a known good ground.

If there is no continuity, repair wire 1023 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

Step 4. Disconnect jumperwire 2768 (white) from PUMP COOLER indicator terminals. Check for continuity across jumperwire 2768 (white) from terminal to terminal.

a. If there is continuity, replace cab PUMP COOLER indicator (WP 0196).

b. If there is no continuity, repair or replace jumperwire 2768 (TM 9-2320-315-14&P).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install cab instrument panel B (WP 0203)
2. Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP COOLER INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

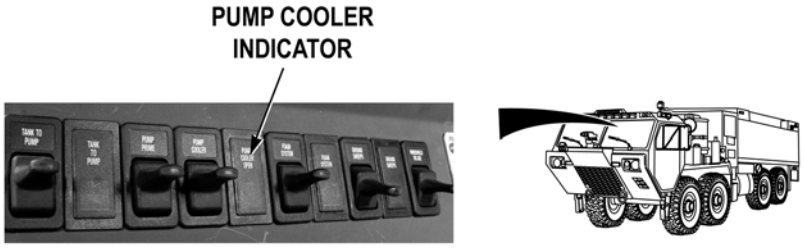
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0070

References (continued)
WP 0205
WP 0211
WP 0212
WP 0304

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PUMP COOLER INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)



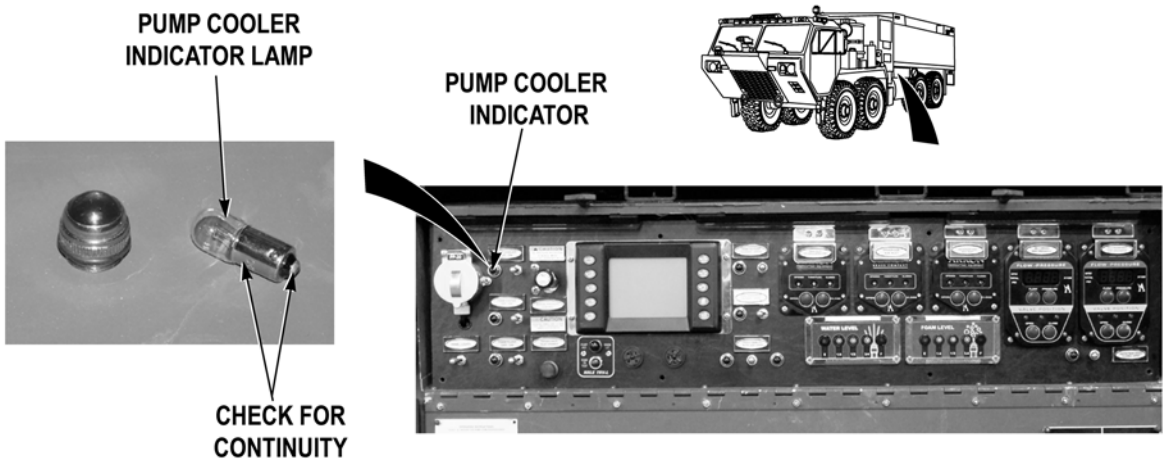
NOTE

Step 1 will ensure that pump cooler system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

Step 1. Push battery disconnect switch to on position (WP 0007). Open pump operator's panel cover (WP 0010). Put pump operator's panel PUMP COOLER switch to ON position (WP 0004). Check if cab PUMP COOLER indicator illuminates.

If cab PUMP COOLER indicator does not illuminate, troubleshoot Pump Cooler Valve Does Not Operate Properly (WP 0070).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



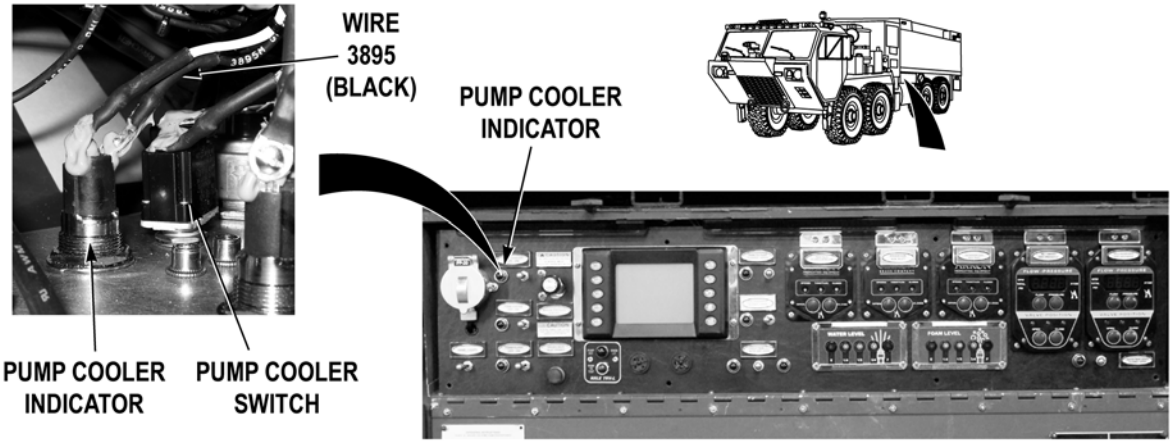
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 2. Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel PUMP COOLER indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace lamp (WP 0212).

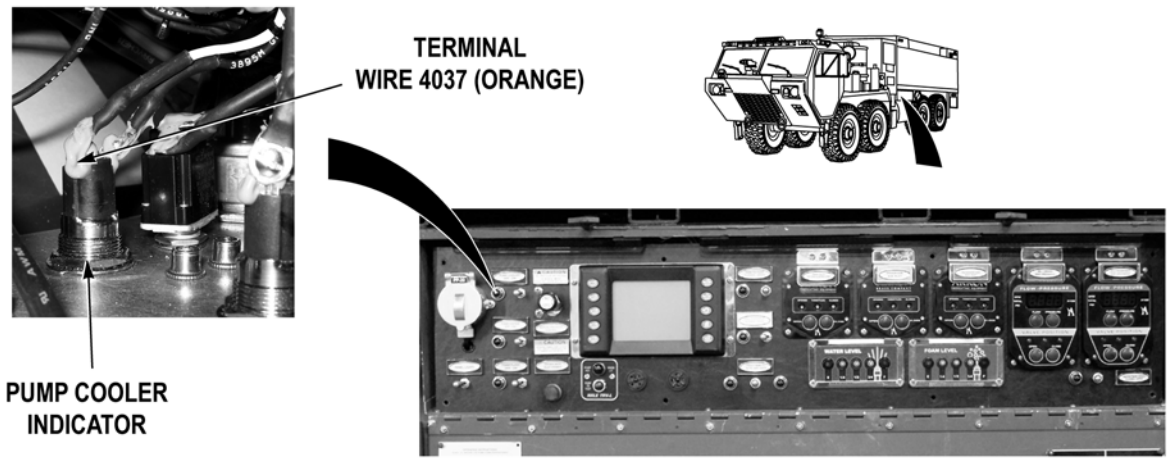
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Install lamp in pump operator's panel PUMP COOLER indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel wire harness PUMP COOLER indicator to a known good ground.

If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel PUMP COOLER switch to ON position (WP 0004). Check for 22 to 28 VDC between wire 4037 (orange) at pump operator's panel wire harness PUMP COOLER indicator terminal, and a known good ground.

a. If 22 to 28 VDC are present, replace pump operator's panel PUMP COOLER indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 4037 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP PTO ENGAGED INDICATOR DOES NOT ILLUMINATE (CAB)

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

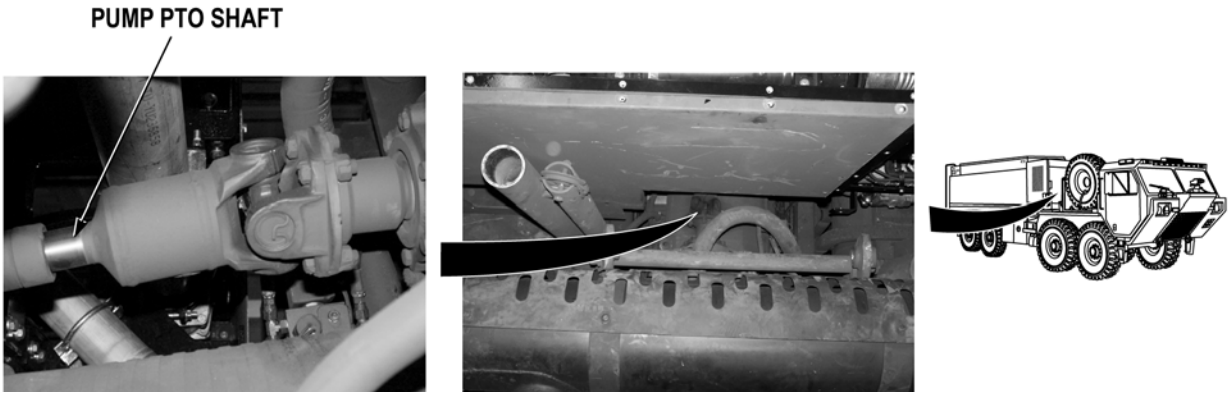
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0077
WP 0153

References (continued)
WP 0196
WP 0203
WP 0279
WP 0280
WP 0293

Equipment Conditions
Cab instrument panel C removed (WP 0203)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PUMP PTO ENGAGED INDICATOR DOES NOT ILLUMINATE (CAB)



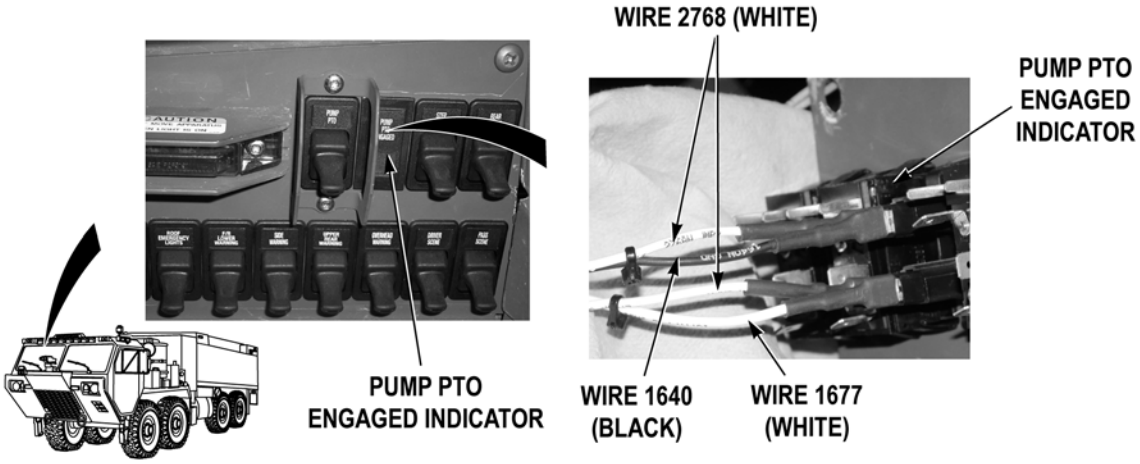
WARNING

Stay clear of rotating PTO drive shaft. Clothing or other material may catch on rotating PTO drive shaft, causing damage to equipment or serious injury or death to personnel.

Step 1. Start engine (TM 9-2320-279-10). Put cab PUMP PTO switch to on position (WP 0004). Check if PUMP PTO drive shaft rotates.

If PTO drive shaft does not rotate, troubleshoot Water PUMP PTO Does Not Engage When Selected (WP 0077).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 2. Remove cab instrument panel C (WP 0203). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1677 (white) at PUMP PTO ENGAGED indicator connector and a known good ground, with PUMP PTO engaged.

If 22 to 28 VDC are not present, go to Step 5.

Step 3. Put cab PUMP PTO switch to off position (WP 0004). Shut off engine (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab instrument panel wire harness wire 1640 (black) from PUMP PTO ENGAGED indicator connector to a known good ground.

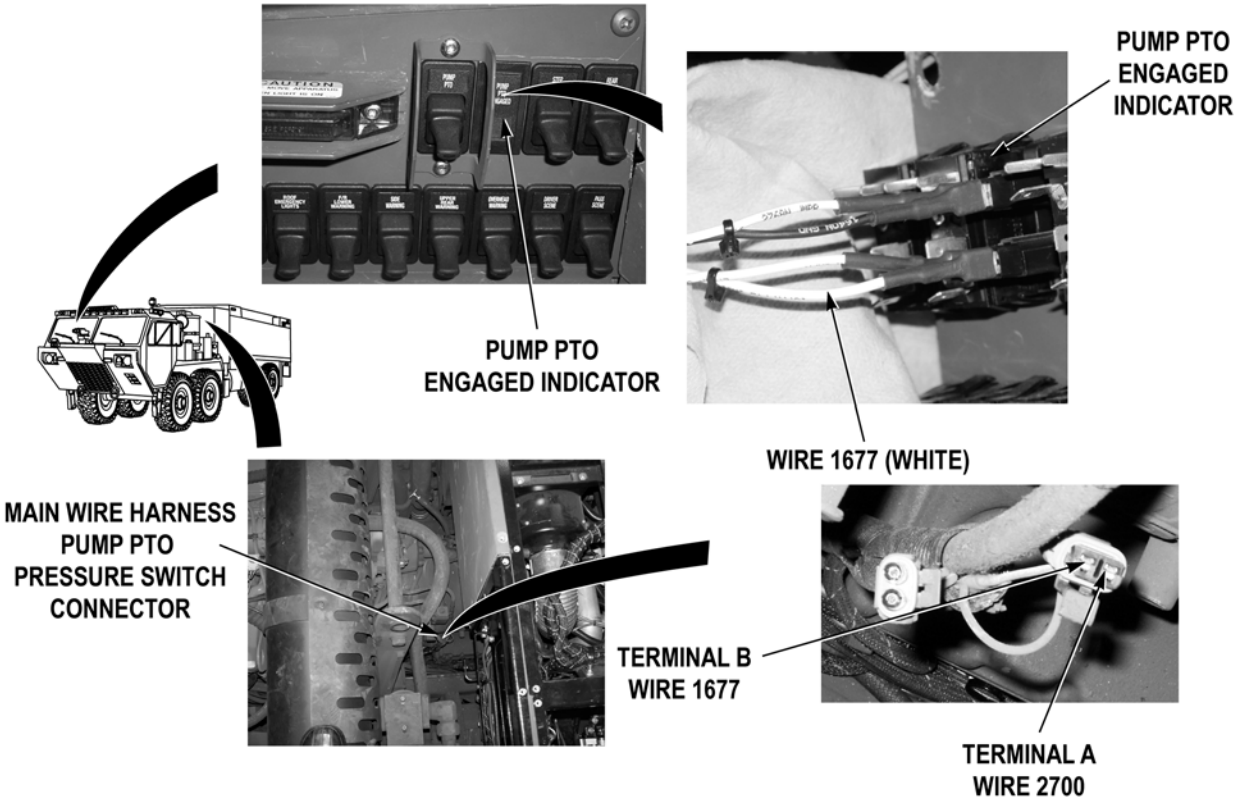
If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 4. Remove jumperwire 2768 (white) from PUMP PTO ENGAGED indicator terminals. Check for continuity across wire 2768 (white).

a. If there is continuity, replace PUMP PTO ENGAGED indicator lamp (WP 0196).

b. If there is no continuity, repair or replace jumperwire 2768 (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



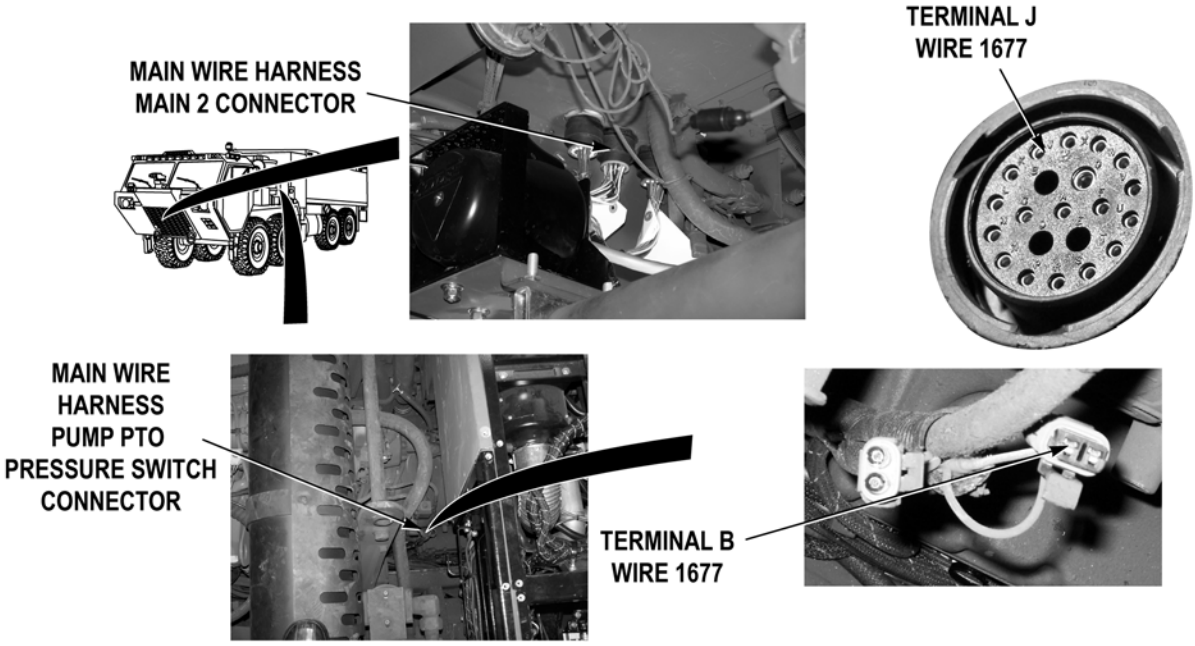
Step 5. Put cab PUMP PTO switch to off position (WP 0004). Shut off engine (TM 9-2320-279-10). Disconnect main wire harness PUMP PTO pressure switch connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2700 (red) at PUMP PTO pressure switch connector, terminal A and a known good ground.

If 22 to 28 VDC are not present, go to Step 8.

Step 6. Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness PUMP PTO ENGAGED indicator wire 1677 (white). With a test lead set, check for continuity across wire 1677 (white) from main wire harness PUMP PTO pressure switch connector, terminal B to cab instrument panel wire harness PUMP PTO ENGAGED indicator wire 1677 connector.

If there is continuity, replace PUMP PTO pressure switch (WP 0153).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

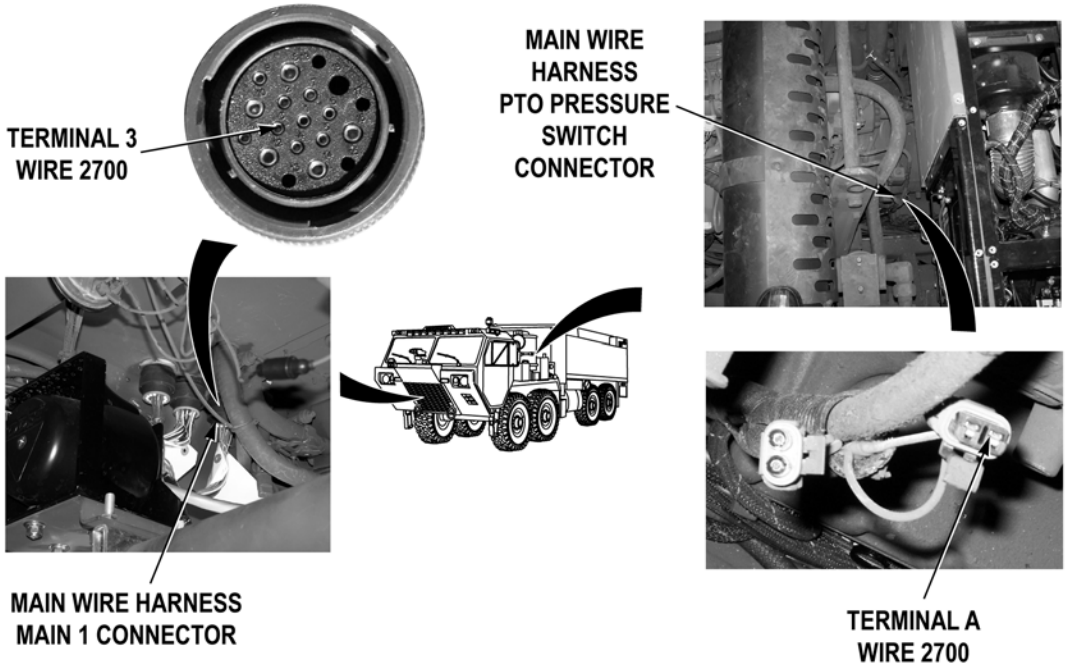


Step 7. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 1677 (white) from main wire harness PUMP PTO pressure switch connector, terminal B to main wire harness main 2 connector, terminal J.

a. If there is continuity, repair wire 1677 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1677 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 2700 (red) from main 1 connector, terminal 3 to PTO pressure switch connector, terminal A.

a. If there is continuity, repair wire 2700 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2700 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install cab instrument panel C (WP 0203)
2. Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP HOT AUDIO ALARM OR INDICATOR DOES NOT OPERATE PROPERLY (PUMP OPERATOR'S PANEL)

Tools and Special Tools

Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References

TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0010
WP 0072
WP 0254
WP 0201

References (continued)

WP 0205
WP 0216
WP 0274
WP 0293
WP 0303
WP 0304
WP 0341

Equipment Conditions

Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PUMP HOT AUDIO ALARM OR INDICATOR DOES NOT OPERATE PROPERLY (PUMP OPERATOR'S PANEL)

⚠ CAUTION

Do not run priming pump for more than 30 seconds. Failure to comply may result in damage to equipment.

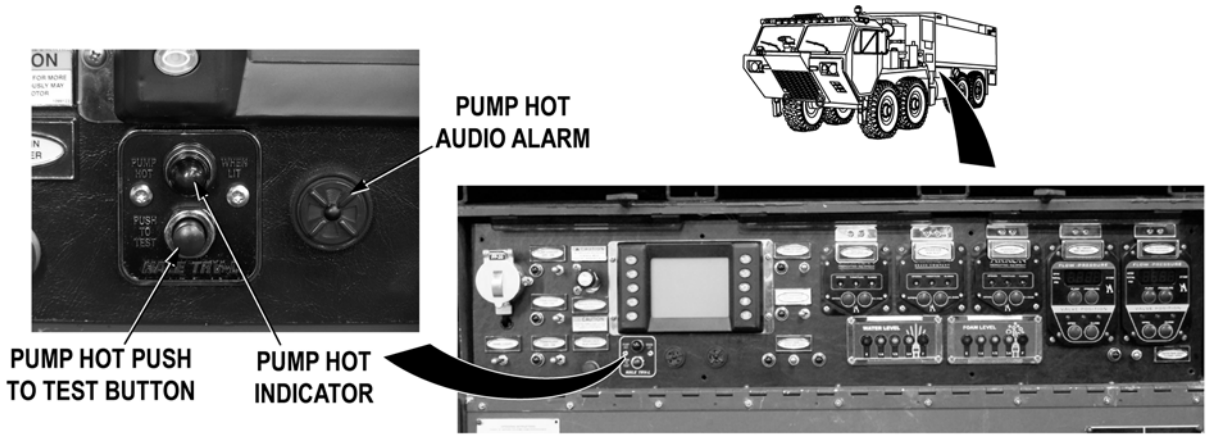
NOTE

- Do not operate water pump during this procedure, except when performing complete system checks. Pump priming system operations can be checked without water pump operation.
- Primer pump operation can be checked by noting loud and distinguishable audible vibrations of primer pump.
- PUMP HOT indication system and primer pump share same power circuit. Step 1 will ensure that pump hot indication system is receiving power.

Step 1. Push battery disconnect switch to on position (WP 0007). Open pump operator's panel cover (WP 0010). While an assistant pushes pump operator's panel DRIVER MAIN INLET PRIMER button or puts cab PUMP PRIME switch to on position (WP 0004), check if pump primer motor operates.

If pump primer motor does not operate, troubleshoot Pump Priming System Does Not Operate Properly (WP 0072).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



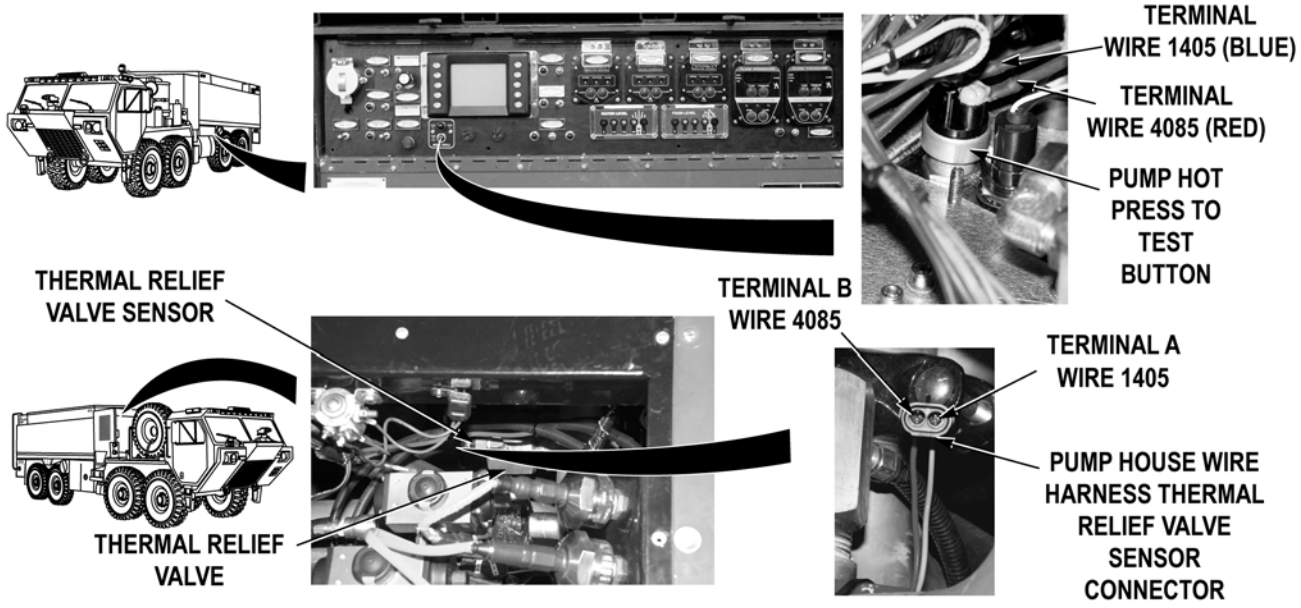
Step 2. Release PUMP PRIME switch (WP 0004). While pressing pump operator's panel PUMP HOT PUSH TO TEST button, check if PUMP HOT audio alarm sounds (WP 0004).

If PUMP HOT audio alarm does not sound, go to Step 12.

Step 3. While pressing pump operator's panel PUMP HOT PUSH TO TEST button, check if PUMP HOT indicator illuminates (WP 0004).

If PUMP HOT indicator does not illuminate, go to Step 10.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

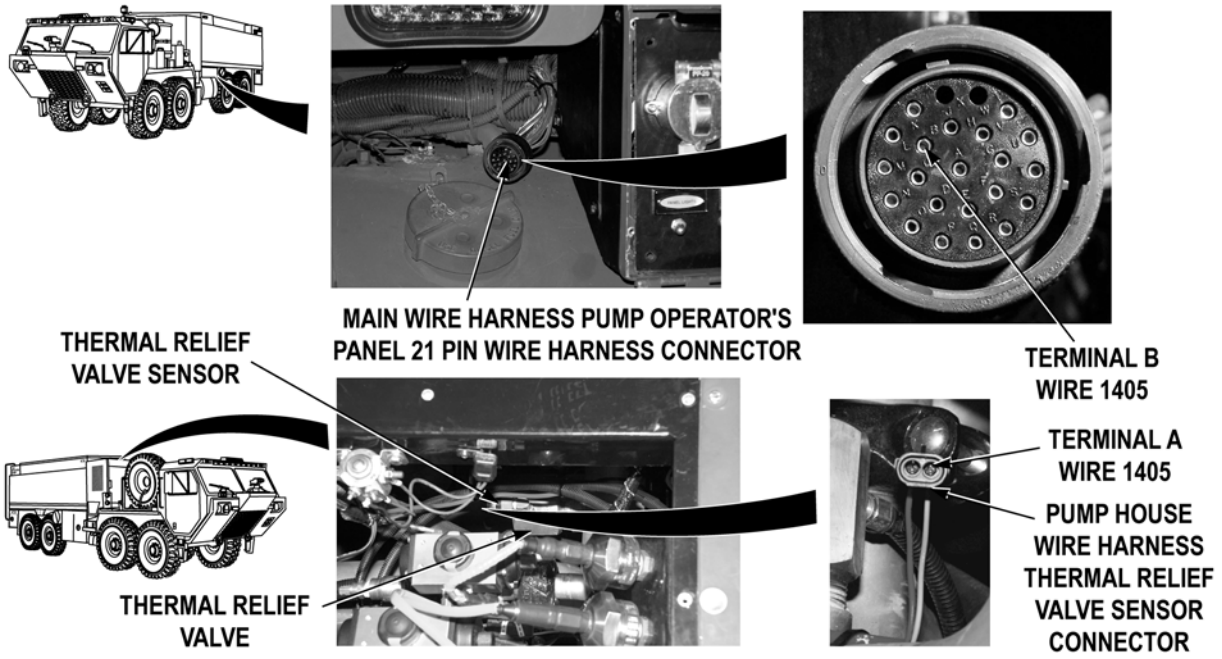
Step 4. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Remove pump house panel K (WP 0341). Disconnect pump house wire harness thermal relief valve sensor connector. With a test lead set, check for continuity across wire 4085 (red) from pump operator's panel wire harness PUMP HOT PUSH TO TEST button, terminal to pump house wire harness thermal relief valve sensor connector, terminal B.

If there is no continuity, go to Step 8.

Step 5. With a test lead set, check for continuity across wire 1405 (blue) from pump house wire harness thermal relief valve sensor connector, terminal A to pump operator's panel harness PUMP HOT PUSH TO TEST button terminal.

If there is continuity, replace thermal relief valve sensor (WP 0274).

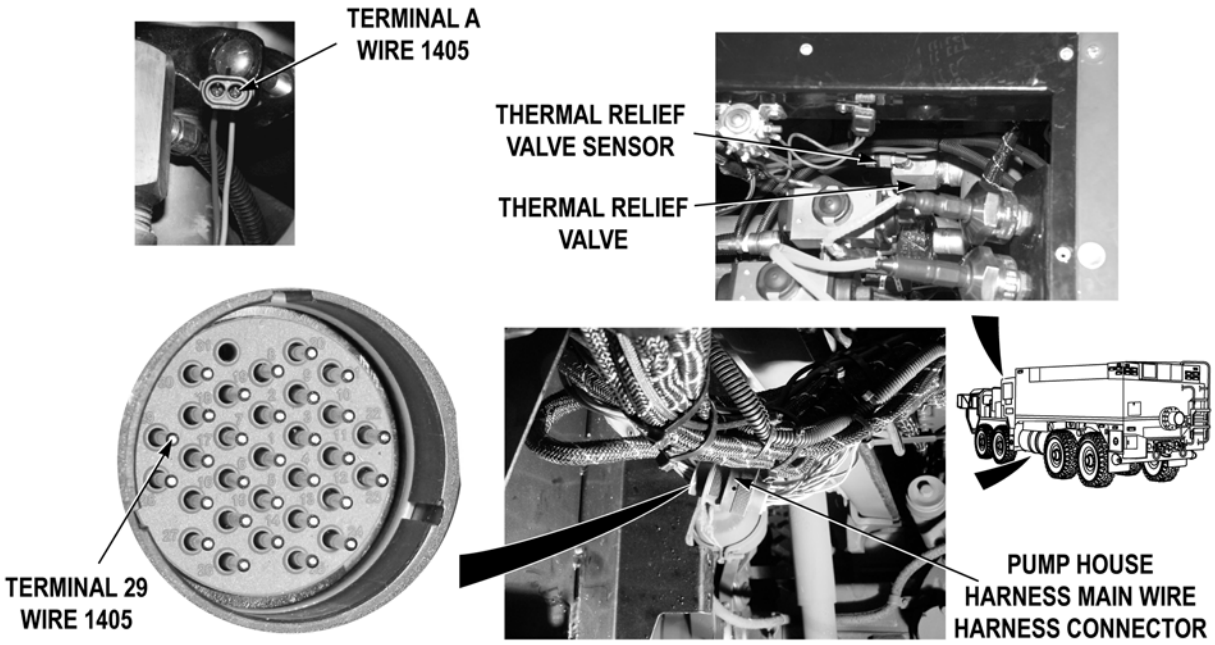
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Disconnect main wire harness pump operator’s panel 21 pin wire harness connector. With a test lead set, check for continuity across wire 1405 (blue) from pump house wire harness thermal relief valve sensor connector, terminal A to main wire harness pump operator’s panel 21 pin wire harness connector, terminal B.

If there is continuity, repair wire 1405 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

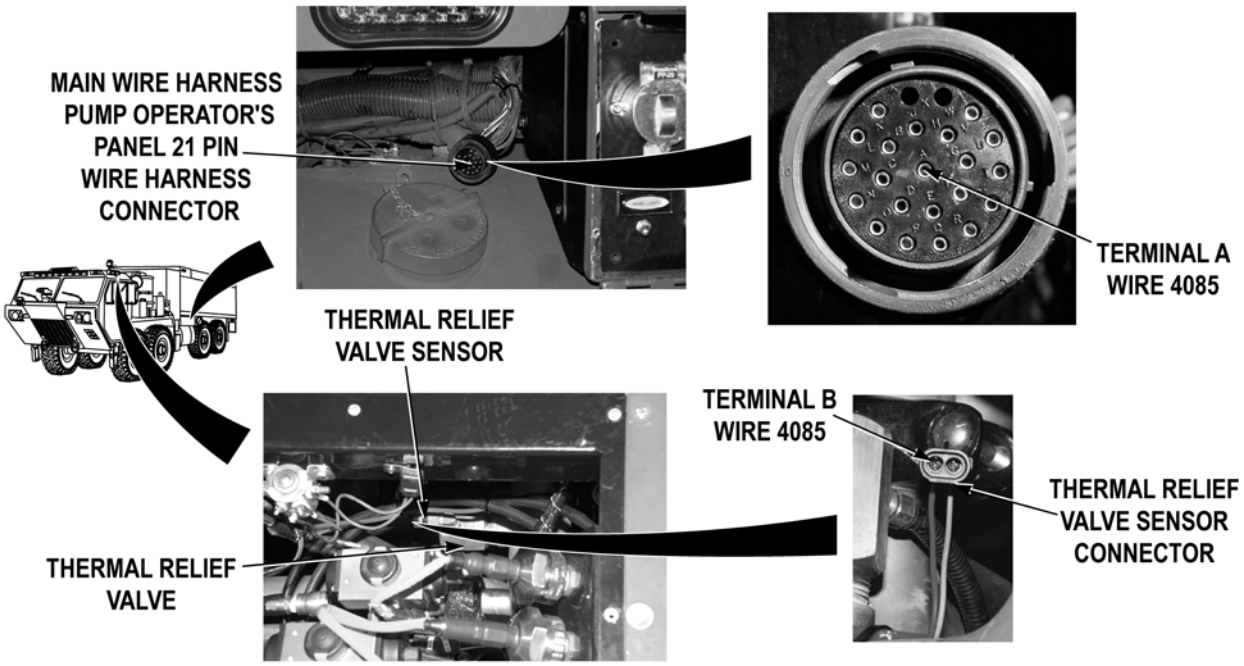


Step 7. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 1405 (blue) from thermal relief valve sensor connector, terminal A to pump house wire harness connector, terminal 29.

a. If there is continuity, repair wire 1405 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1405 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

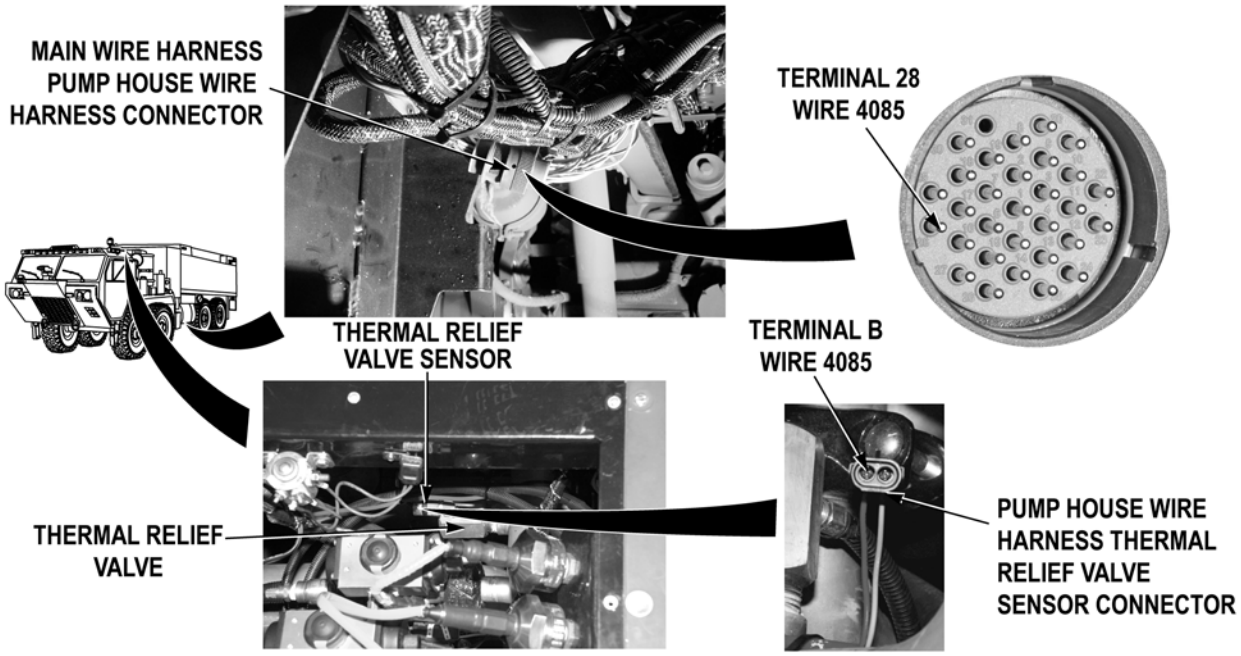
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Disconnect main wire harness pump operator's panel 21 pin wire harness connector. With a test lead set, check for continuity across wire 4085 (red) from main wire harness pump operator's panel 21 pin wire harness connector, terminal A to pump house wire harness thermal relief valve sensor connector, terminal B.

If there is continuity, repair wire 4085 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

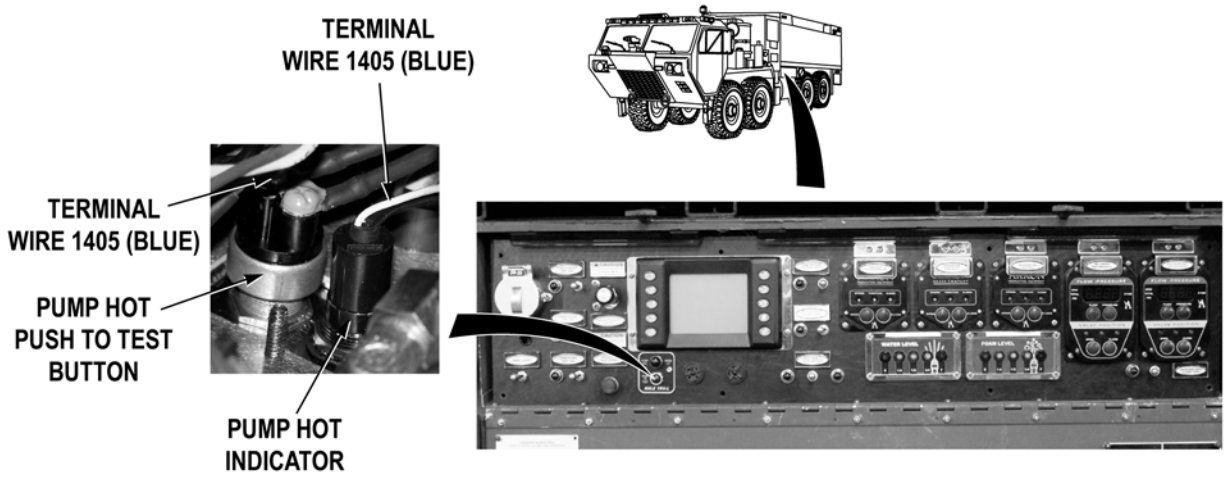


Step 9. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 4085 (red) from main wire harness pump house wire harness connector, terminal 28 to thermal relief valve sensor connector, terminal B.

a. If there is continuity, repair wire 4085 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 4085 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



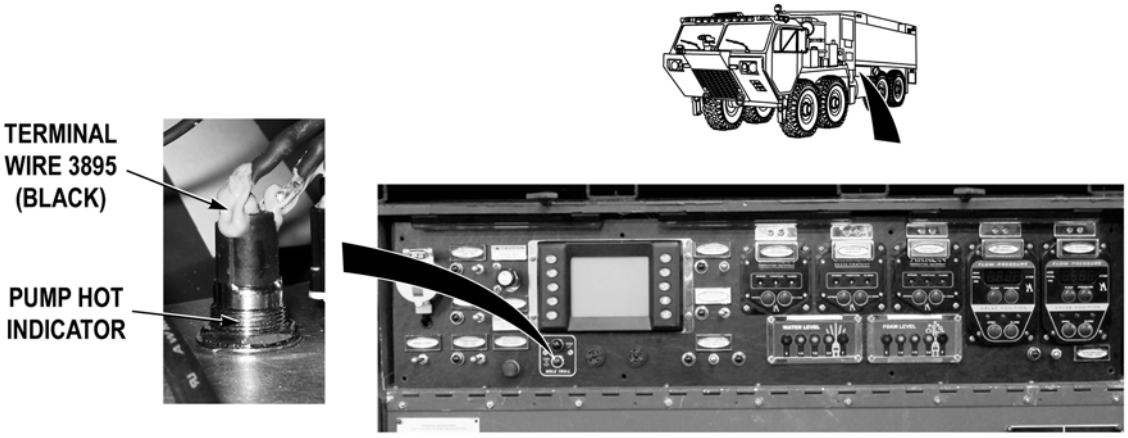
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 10. Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel pump HOT indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace PUMP HOT indicator lamp (WP 0212).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Check for continuity across pump operator's panel wire harness wire 3895 (black) from PUMP HOT indicator terminal to a known good ground.

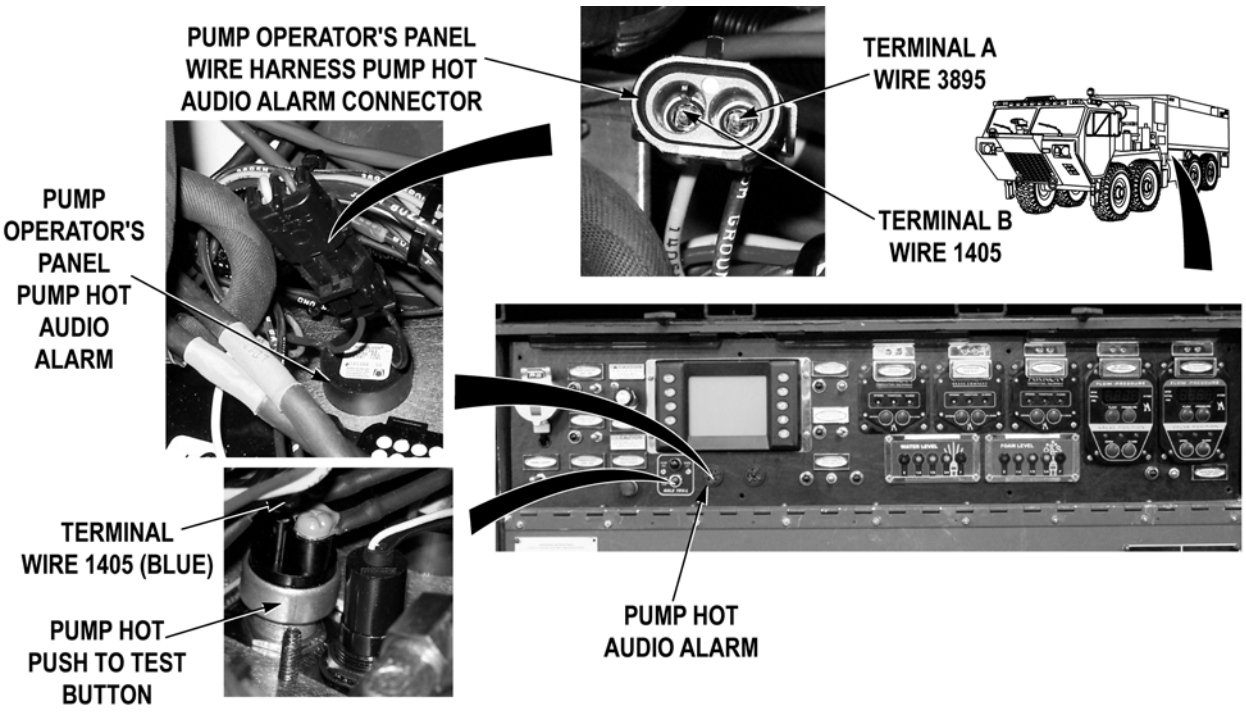
a. If there is continuity, replace PUMP HOT indicator (WP 0216).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 12. While pushing pump operator's panel PUMP HOT PUSH TO TEST button, check if PUMP HOT indicator illuminates (WP 0004).

If PUMP HOT indicator does not illuminate, go to Step 15.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness pump hot audio alarm connector (WP 0201). Check for continuity across pump operator's panel wire harness wire 1405 (blue) from PUMP HOT PUSH TO TEST button, terminal to pump hot audio alarm connector, terminal B.

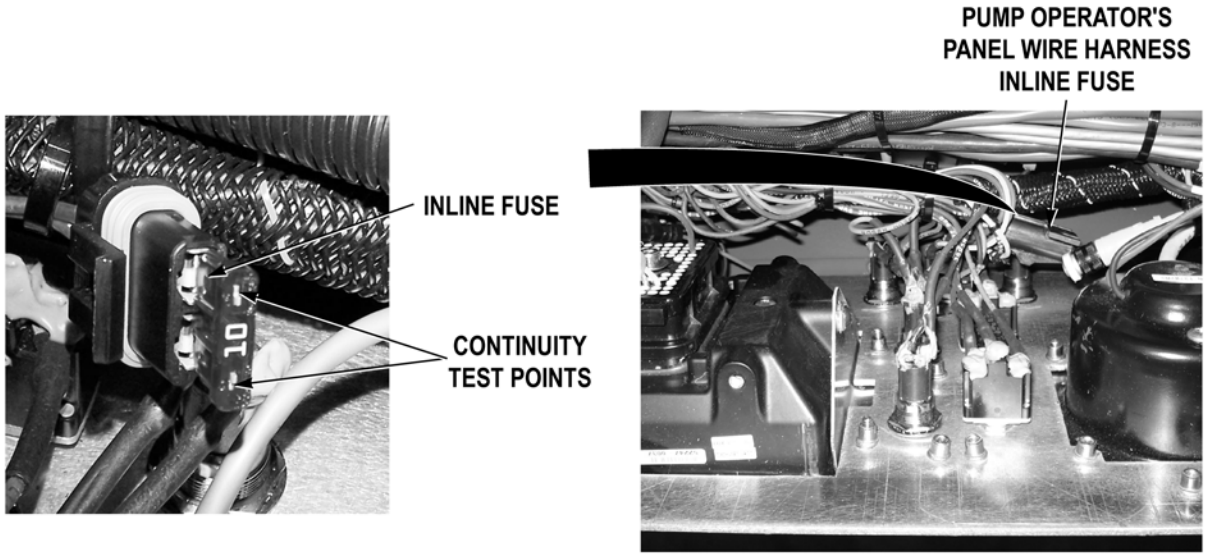
If there is no continuity, repair wire 1405 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 14. Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump hot audio alarm, terminal A to a known good ground.

a. If there is continuity, replace pump hot audio alarm (WP 0201).

b. If there is no continuity, repair wire 1405 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

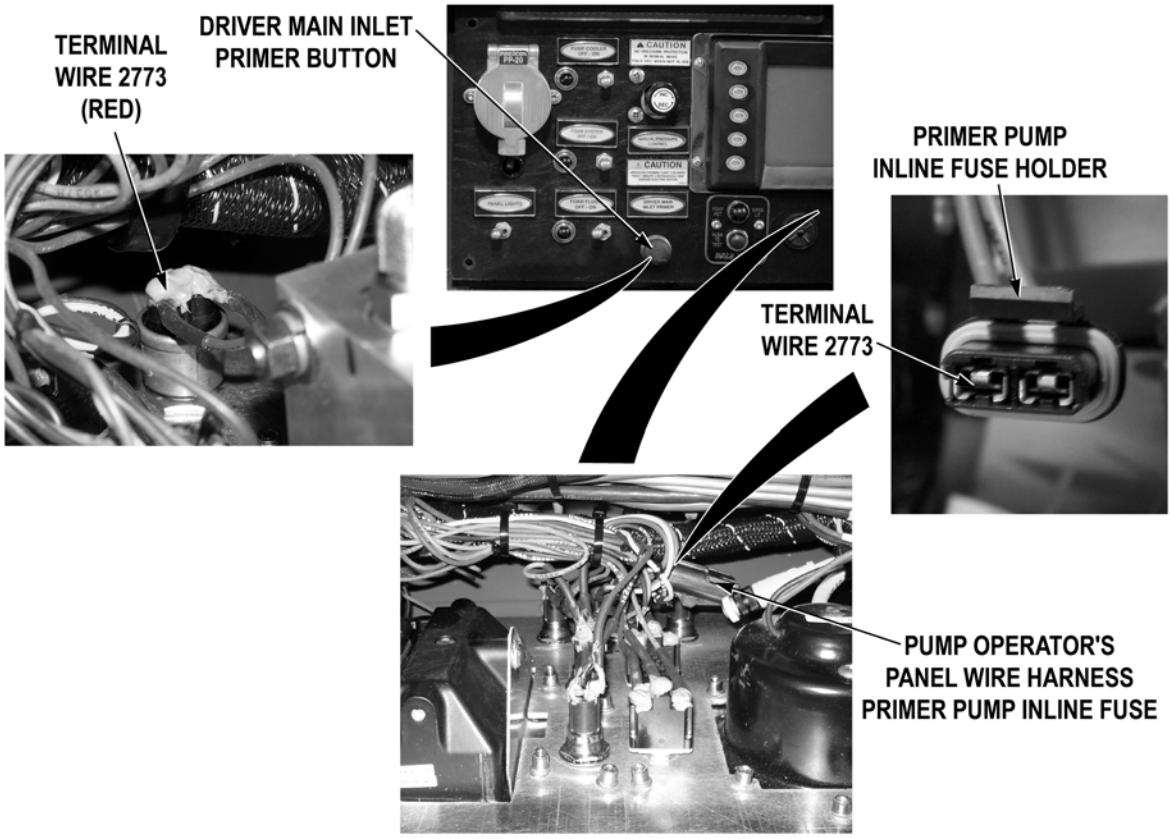
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Remove primer pump inline fuse (WP 0254). Check for continuity across fuse.

If there is no continuity, replace fuse (WP 0254).

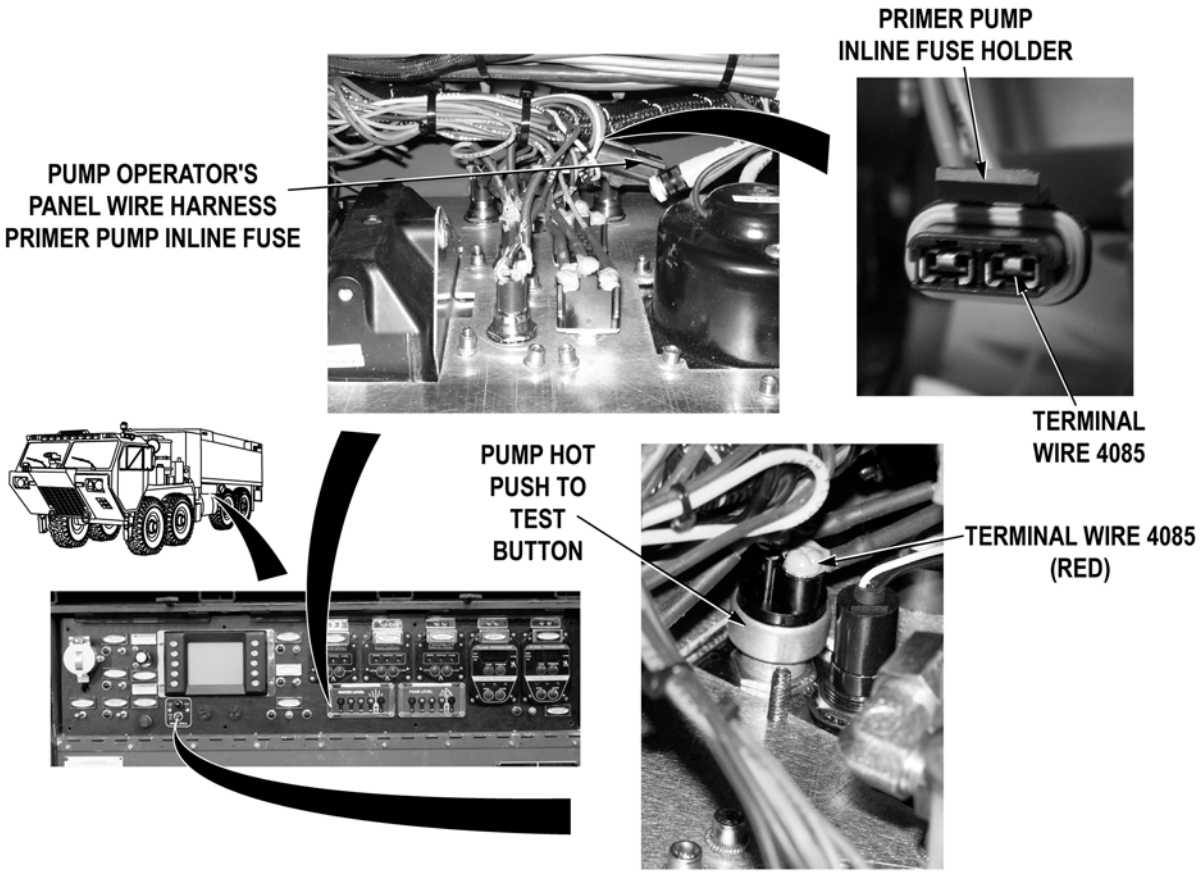
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Check for continuity across pump operator's panel wire harness wire 2773 (red) from DRIVER MAIN INLET PRIMER button terminal to primer pump inline fuse terminal.

If there is no continuity, repair wire 2773 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

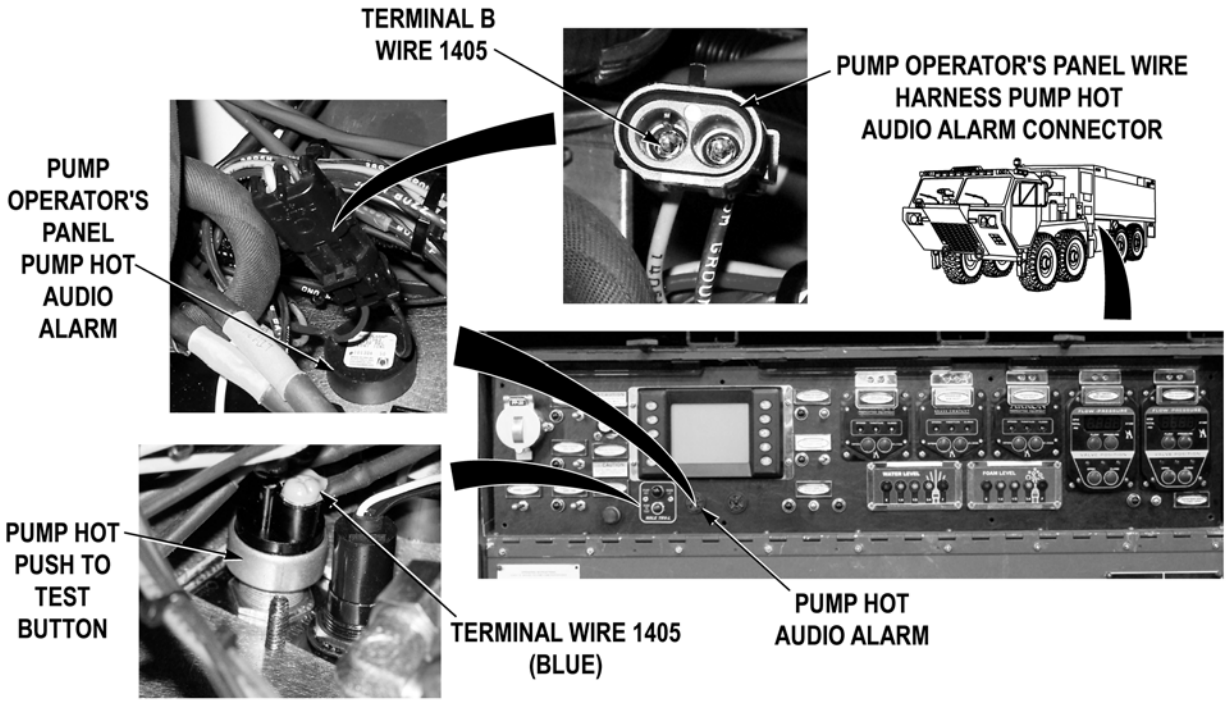
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Check for continuity across pump operator's panel wire 4085 (red) from primer pump inline fuse terminal to PUMP HOT PUSH TO TEST button terminal.

a. If there is no continuity, repair wire 4085 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

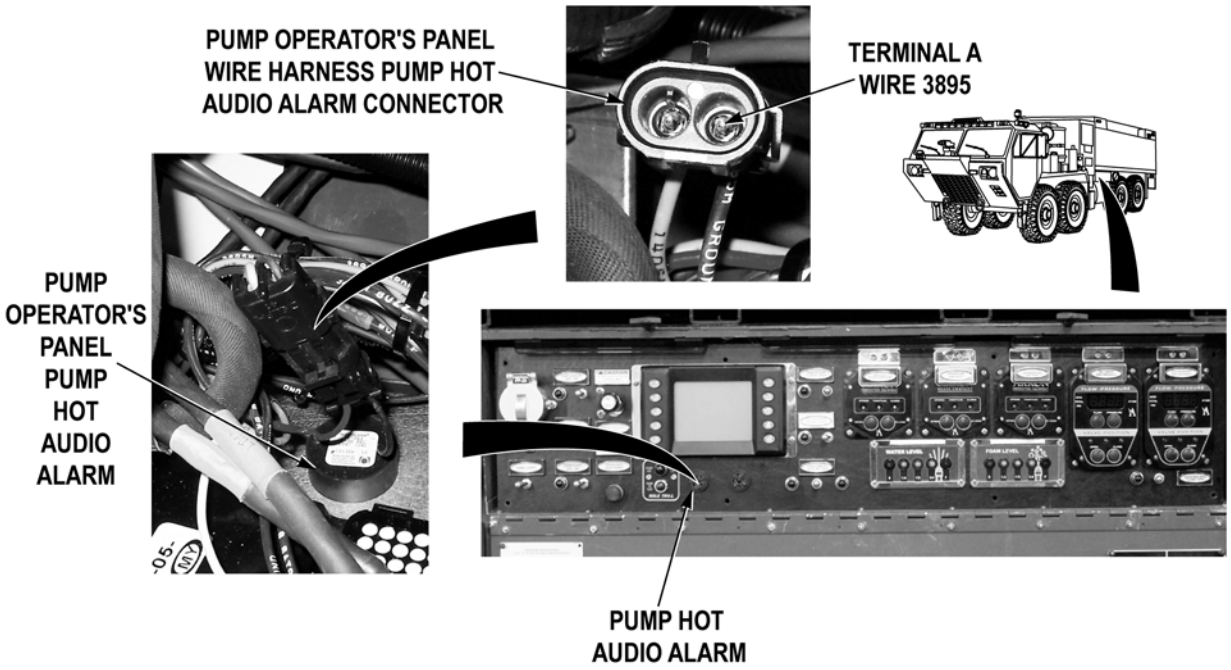
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Check for continuity across pump operator’s panel wire harness wire 1405 (blue) from PUMP HOT PUSH TO TEST switch terminal to PUMP HOT audio alarm connector, terminal B.

If there is no continuity, repair wire 1405 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Check for continuity across pump operator’s panel wire harness wire 3895 (black) from PUMP HOT audio alarm, terminal A to a known good ground.

a. If there is continuity, replace PUMP HOT PUSH TO TEST switch and indicator (WP 0216).

b. If there is no continuity, repair wire 1405 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WATER TANK DRAIN INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0078
WP 0205

References (continued)
WP 0211
WP 0212
WP 0304
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

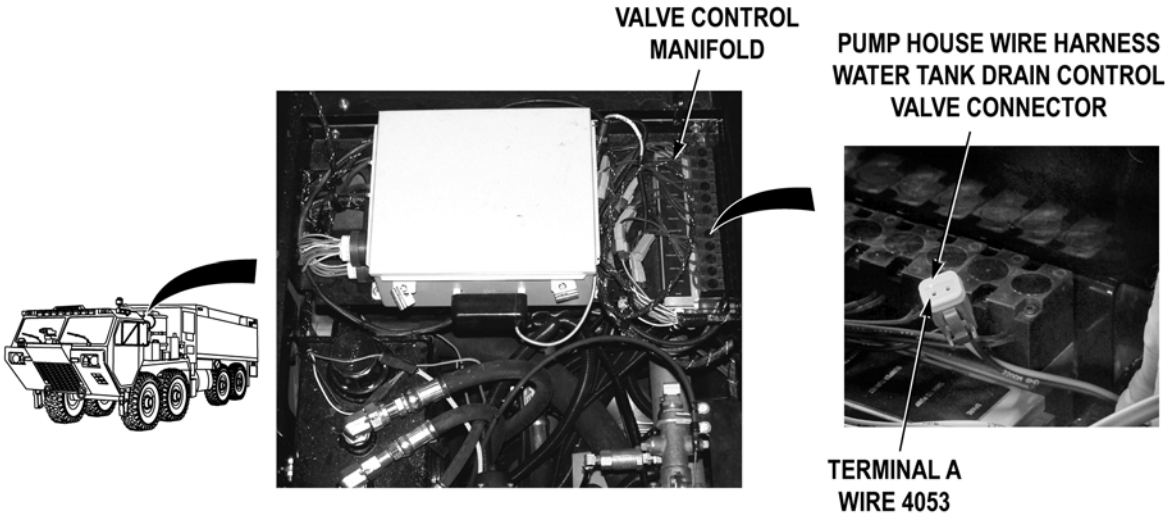
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WATER TANK DRAIN INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

NOTE

- Do not operate WATER TANK DRAIN switch except when noted in Step 1. If water tank drain valve is operated when water tank is filled, water will be discharged from water tank uncontrolled. Water tank drain valve is not activated in Step 1.
- Step 1 will ensure that water tank drain system is operating properly or if fault exists in bulb, indicator, or wires leading to indictor.

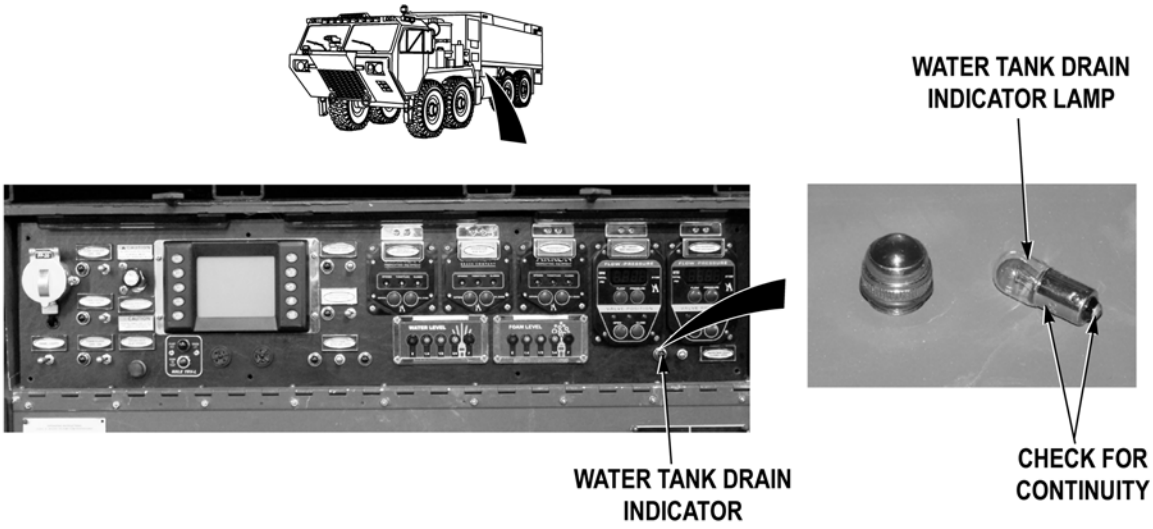
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Remove pump house panel K (WP 0341). Disconnect pump house wire harness water tank drain control valve connector. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel WATER TANK DRAIN switch to OPEN position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4053 (brown) at water tank drain control valve connector, terminal A and a known good ground.

If 22 to 28 VDC are not present, troubleshoot Water Tank Drain Valve Does Not Operate When Selected (WP 0078).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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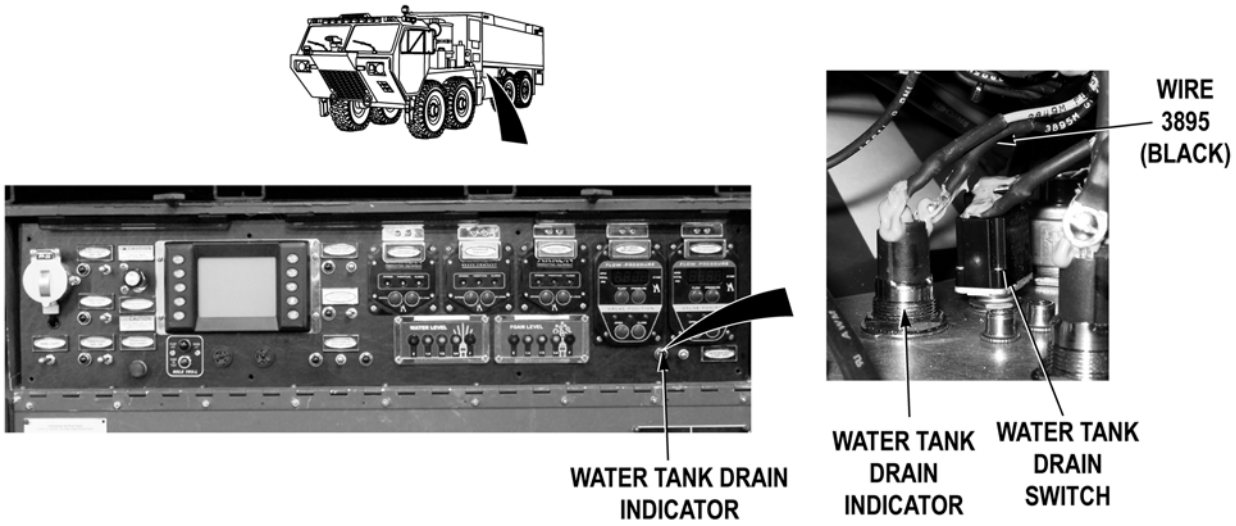
Step 2. Remove lamp from pump operator's panel WATER TANK DRAIN indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace lamp (WP 0212).

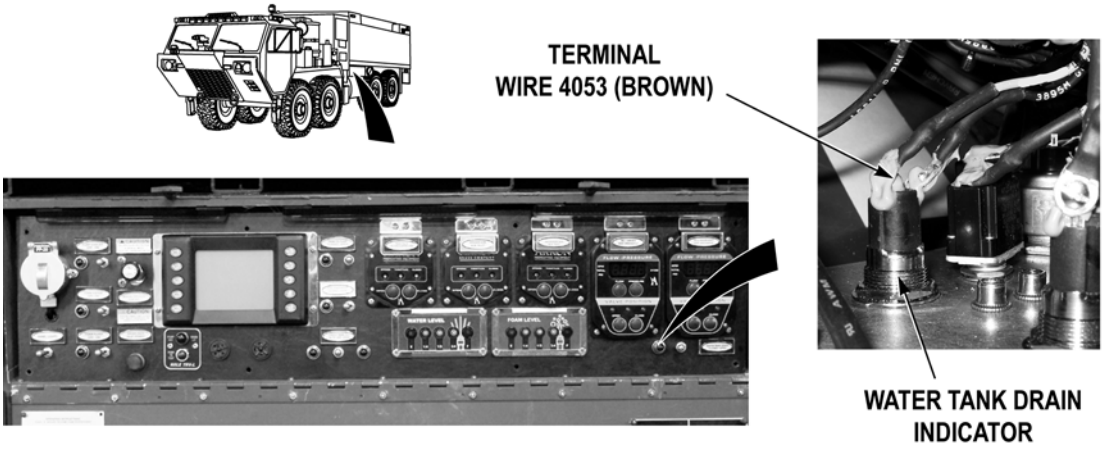
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Install lamp in pump operator's panel WATER TANK DRAIN indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel WATER TANK DRAIN indicator to a known good ground.

If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Put WATER TANK DRAIN switch to OPEN position (WP 0004). Check for 22 to 28 VDC between pump operator's panel wire harness wire 4053 (brown) at WATER TANK DRAIN indicator and a known good ground. Put pump operator's panel WATER TANK DRAIN switch to CLOSED position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Connect pump house wire harness water tank drain control valve connector.

a. If 22 to 28 VDC are present, replace pump operator's panel WATER TANK DRAIN indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 4053 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

TANK TO PUMP INDICATOR DOES NOT ILLUMINATE (CAB)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

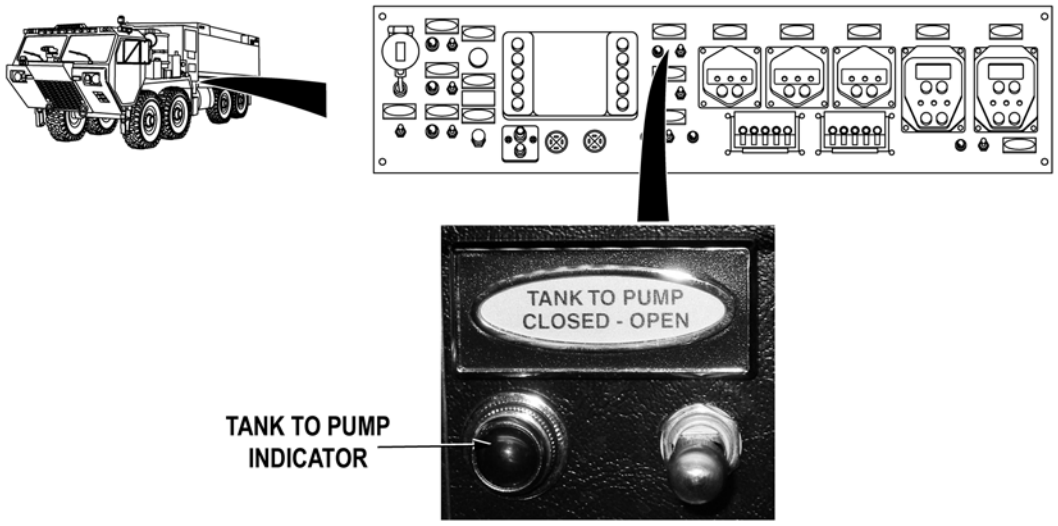
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0074

References (continued)
WP 0196
WP 0203
WP 0281

Equipment Conditions
Cab instrument panel B removed (WP 0203)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TANK TO PUMP INDICATOR DOES NOT ILLUMINATE (CAB)



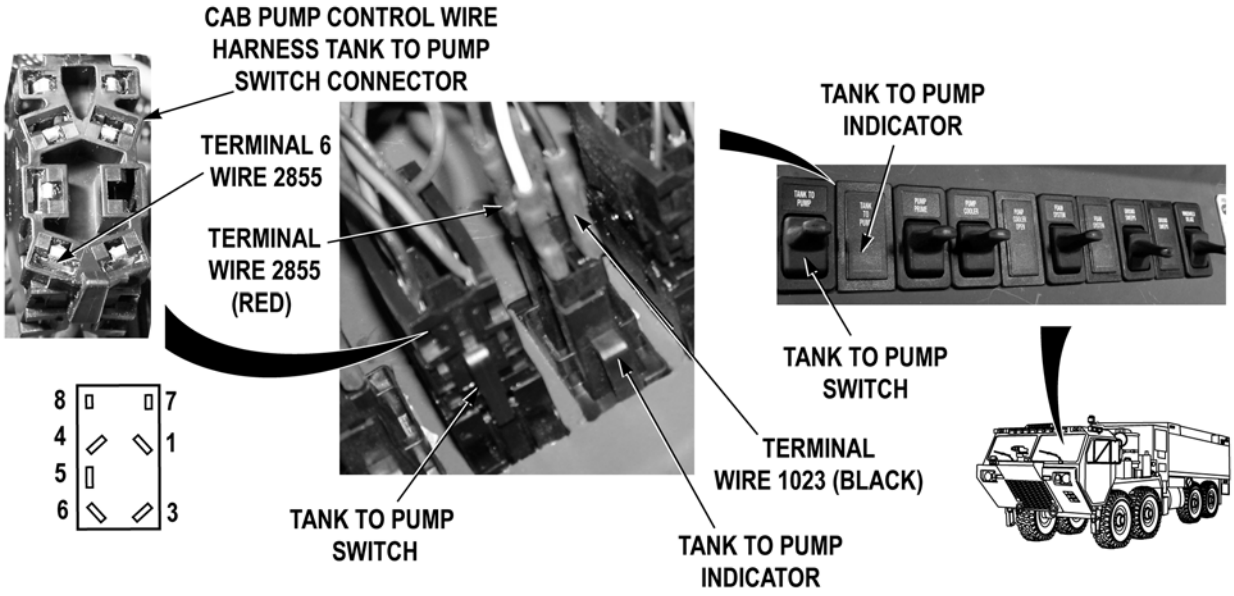
NOTE

Step 1 will ensure that tank-to-pump valve is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

Step 1. Push battery disconnect switch to on position (WP 0007). Put cab TANK TO PUMP switch to open position (WP 0004). Check if pump operator's panel TANK TO PUMP indicator illuminates.

If pump operator's panel TANK TO PUMP indicator does not illuminate, troubleshoot Tank-To-Pump Valve Does Not Operate Properly (WP 0074).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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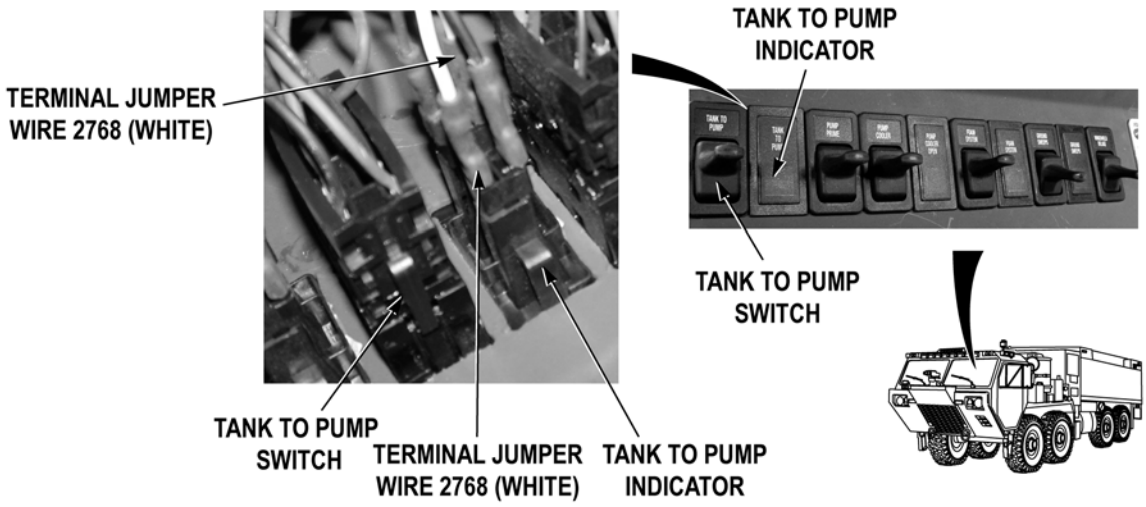
Step 2. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel B (WP 0203). Disconnect cab pump control wire harness TANK TO PUMP switch connector. Disconnect wire 2855 (red) from TANK TO PUMP indicator terminal. Check for continuity across cab pump control wire harness wire 2855 (red) from TANK TO PUMP switch connector, terminal 6 to TANK TO PUMP indicator connector.

If there is no continuity, repair wire 2855 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

Step 3. Connect wire 2855 (red) to TANK TO PUMP indicator terminal. Disconnect wire 1023 (black) from TANK TO PUMP indicator terminal. Check for continuity across cab pump control wire harness wire 1023 (black) from TANK TO PUMP indicator connector to a known good ground.

If there is no continuity, repair wire 1023 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Connect wire 1023 (black) to TANK TO PUMP indicator connector. Disconnect jumperwire 2768 (white) from TANK TO PUMP indicator terminals. Check for continuity across jumperwire 2768 (white) from terminal to terminal.

a. If there is continuity, replace TANK TO PUMP indicator (WP 0196).

b. If there is no continuity, repair or replace jumperwire 2768 (TM 9-2320-315-14&P).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install cab instrument panel B (WP 0203)
2. Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

TANK TO PUMP INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

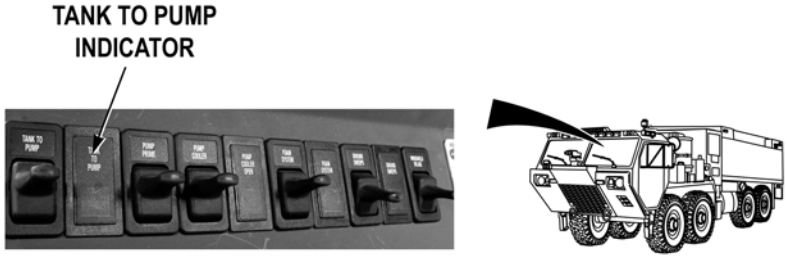
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0074
WP 0205

References (continued)
WP 0211
WP 0212
WP 0304

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TANK TO PUMP INDICATOR DOES NOT ILLUMINATE (PUMP OPERATOR'S PANEL)



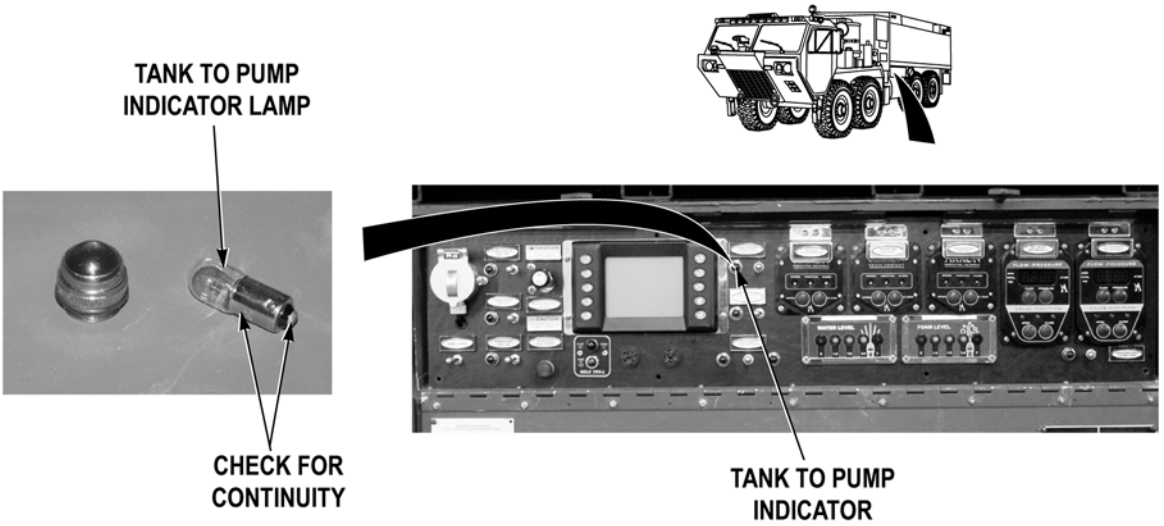
NOTE

Step 1 will ensure that tank-to-pump valve is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

Step 1. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel TANK TO PUMP switch to OPEN position (WP 0004). Check if cab TANK TO PUMP indicator illuminates.

If cab TANK TO PUMP indicator does not illuminate, troubleshoot Tank-To-Pump Valve Does Not Operate Properly (WP 0074).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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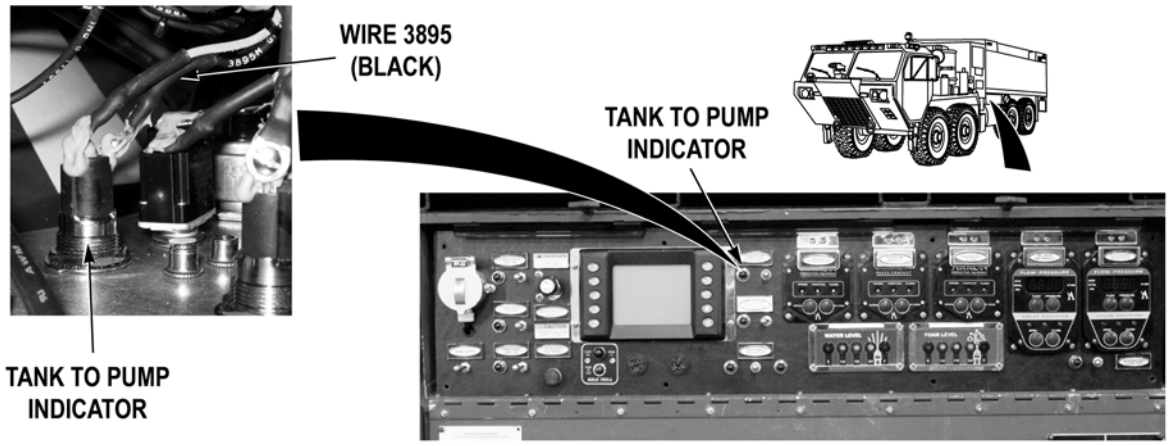
Step 2. Pull battery disconnect switch to off position (WP 0007). Remove lamp from pump operator's panel TANK TO PUMP indicator (WP 0212). Check for continuity across lamp.

If there is no continuity, replace lamp (WP 0212).

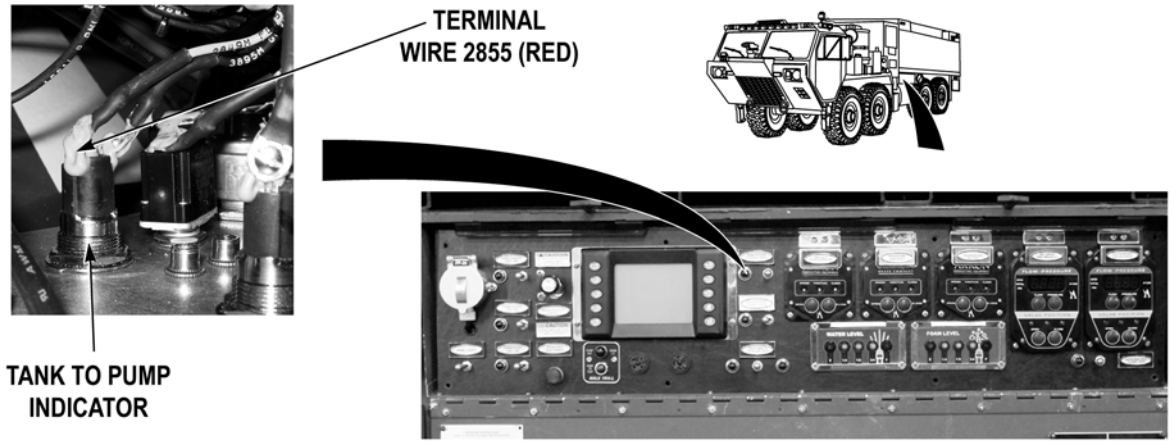
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Install lamp in pump operator's panel TANK TO PUMP indicator (WP 0212). Open pump operator's panel (WP 0205). Check for continuity across pump operator's panel wire harness wire 3895 (black) from pump operator's panel TANK TO PUMP indicator to a known good ground.

If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Push battery disconnect switch to on position (WP 0007). Put pump operator's panel TANK TO PUMP switch to OPEN position (WP 0004). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2855 (red) from pump operator's panel TANK TO PUMP indicator to a known good ground.

a. If 22 to 28 VDC are present, replace TANK TO PUMP indicator (WP 0211).

b. If 22 to 28 VDC are not present, repair wire 2855 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

UNDER TRUCK NOZZLES INDICATOR DOES NOT ILLUMINATE (CAB)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0009

References (continued)
WP 0075
WP 0196
WP 0203
WP 0281

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

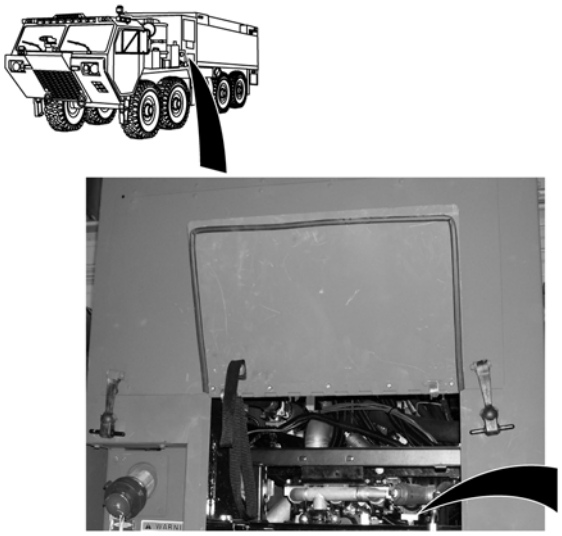
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

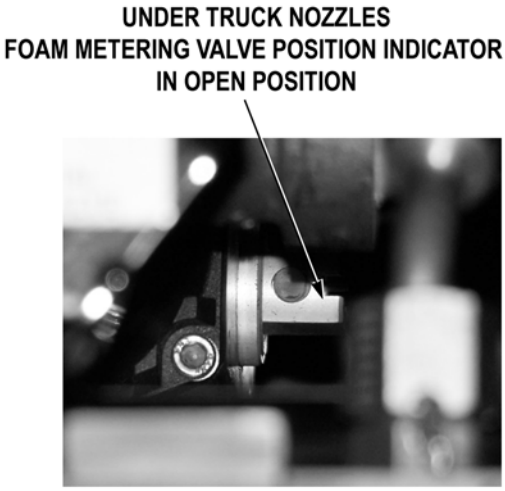
UNDER TRUCK NOZZLES INDICATOR DOES NOT ILLUMINATE (CAB)

NOTE

- Ensure system air pressure is at least 85 psi (586 kPa) when operating under truck nozzle foam metering valve during this procedure. System air pressure is required to activate valves.
- Do not engage PUMP PTO during this procedure. Valve operation can be checked without pump operation.
- Valve operations can be checked by observing valve shaft rotation. Valves are open when tabs or yellow paint tabs are aligned with direction of fluid flow.
- Step 1 will ensure that under truck nozzles system is operating properly or if fault exists in bulb, indicator, or wires leading to indicator.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

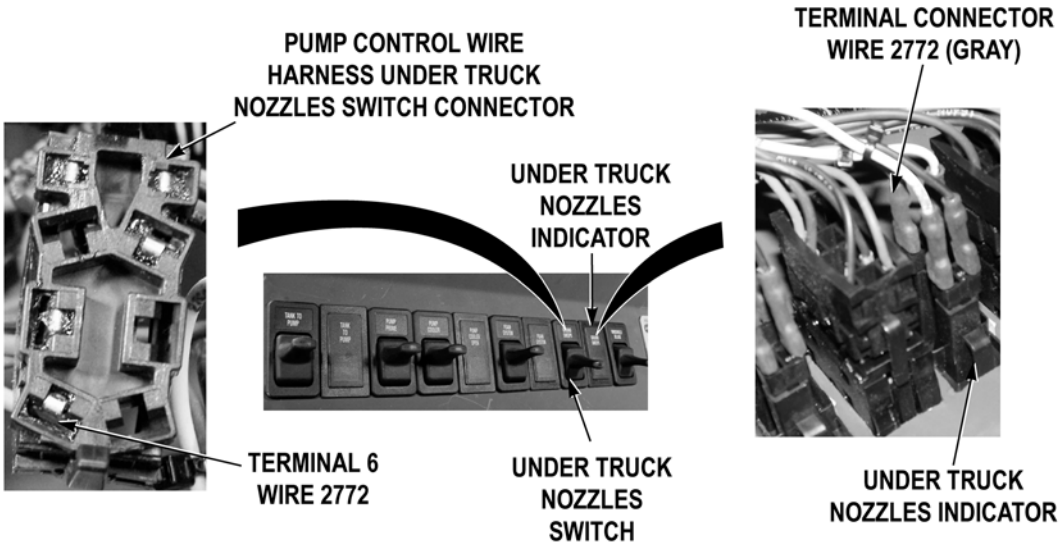




Step 1. Push battery disconnect switch to on position (WP 0007). If system air pressure is below 85 psi (586 kPa), start engine and allow system air pressure to build to at least 85 psi (586 kPa) (TM 9-2320-279-10). Then shut off engine (TM 9-2320-279-10). Put cab FOAM SYSTEM switch to on position (WP 0004). Open pump house access door assembly (WP 0009). While an assistant puts cab UNDER TRUCK NOZZLES switch to on position (WP 0004), check if under truck nozzles foam metering valve operates to open position.

If under truck nozzles foam metering valve does not operate to open position, troubleshoot Under Truck Nozzles Do Not Operate When Selected (WP 0075).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



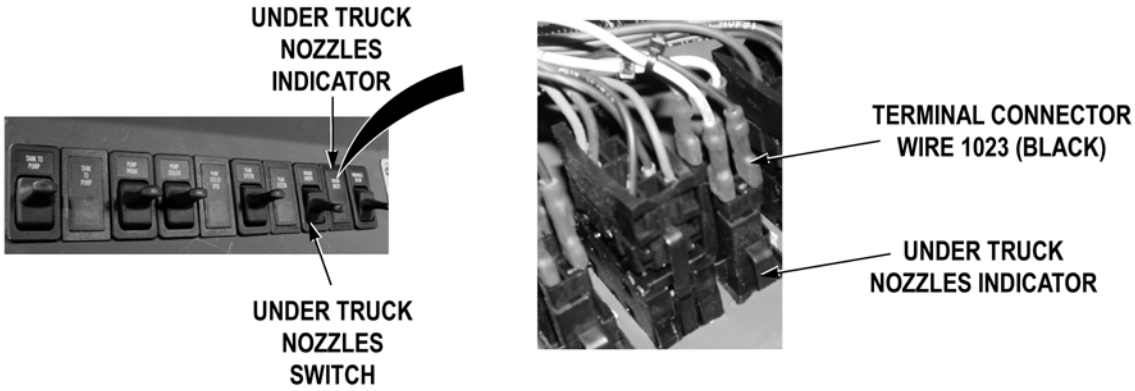
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 2. Put cab UNDER TRUCK NOZZLES switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel B (WP 0203). Disconnect wire 2772 (gray) terminal connector from UNDER TRUCK NOZZLES indicator. Disconnect cab pump control wire harness UNDER TRUCK NOZZLE switch connector from UNDER TRUCK NOZZLES switch. Check for continuity across cab pump control wire harness wire 2772 (gray) from UNDER TRUCK NOZZLES switch connector, terminal 6 to UNDER TRUCK NOZZLES indicator terminal connector.

If there is no continuity, repair wire 2772 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

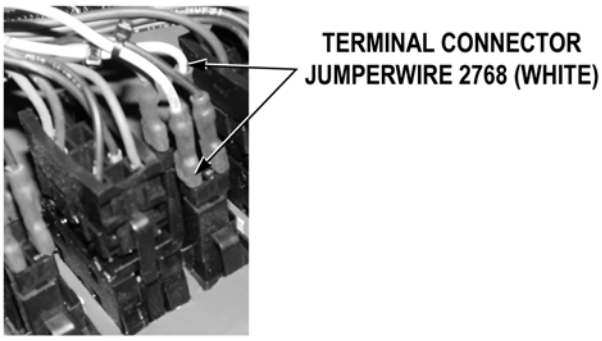
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Disconnect wire 1023 (black) terminal connector from UNDER TRUCK NOZZLES indicator. Check for continuity across cab pump control wire harness wire 1023 (black) from UNDER TRUCK NOZZLES indicator connector to a known good ground.

If there is no continuity, repair wire 1023 in cab pump control wire harness if repairable (TM 9-2320-315-14&P), or replace cab pump control wire harness (WP 0281).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Disconnect jumperwire 2768 (white) from UNDER TRUCK NOZZLES indicator at both terminal connectors. Check for continuity across jumperwire 2768 (white) from terminal to terminal.

a. If there is continuity, replace UNDER TRUCK NOZZLES indicator (WP 0196).

b. If there is no continuity, repair or replace jumperwire 2768 (white) (TM 9-2320-315-14&P).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WARNING LIGHTS (ALL) DO NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

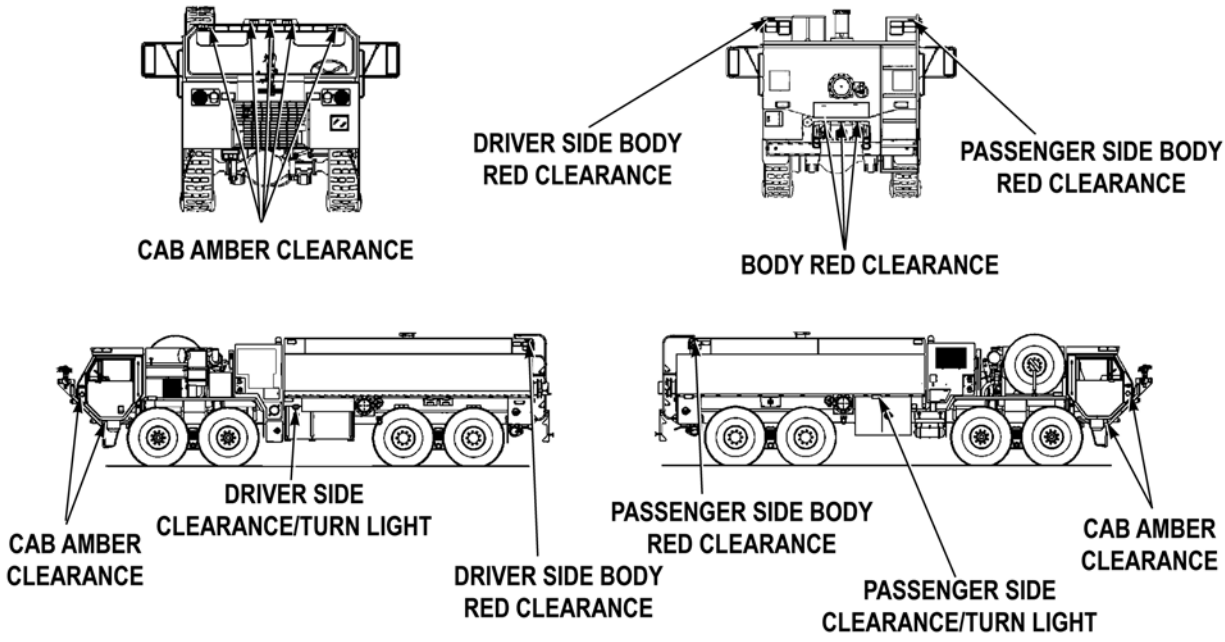
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0197
WP 0203

References (continued)
WP 0238
WP 0240
WP 0242
WP 0279
WP 0280

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

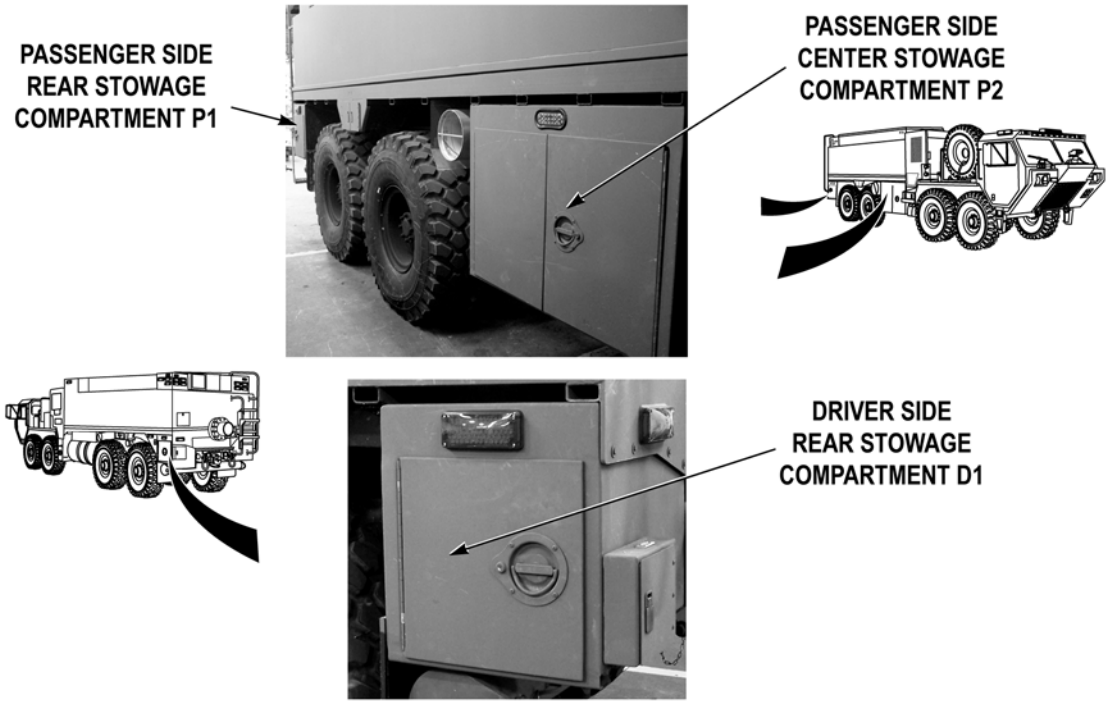
WARNING LIGHTS (ALL) DO NOT OPERATE



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Turn On Clearance Lamps (TM 9-2320-279-10). Check if cab clearance lights operate.

If cab clearance lights do not operate, troubleshoot Clearance and Side Marker Light(s) Do Not Operate (TM 9-2320-315-14&P).

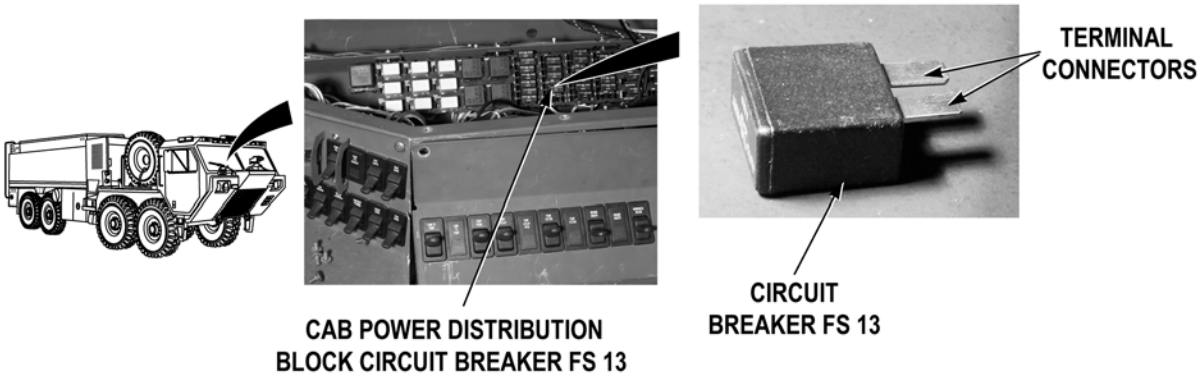
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Open one of the rear compartment doors (WP 0008). Check if compartment light operates.

If compartment light does not operate, go to Step 9.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Close compartment door (WP 0008). Turn Off Clearance Lamps (TM 9-2320-279-10). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 13 (WP 0240). Check for continuity across circuit breaker.

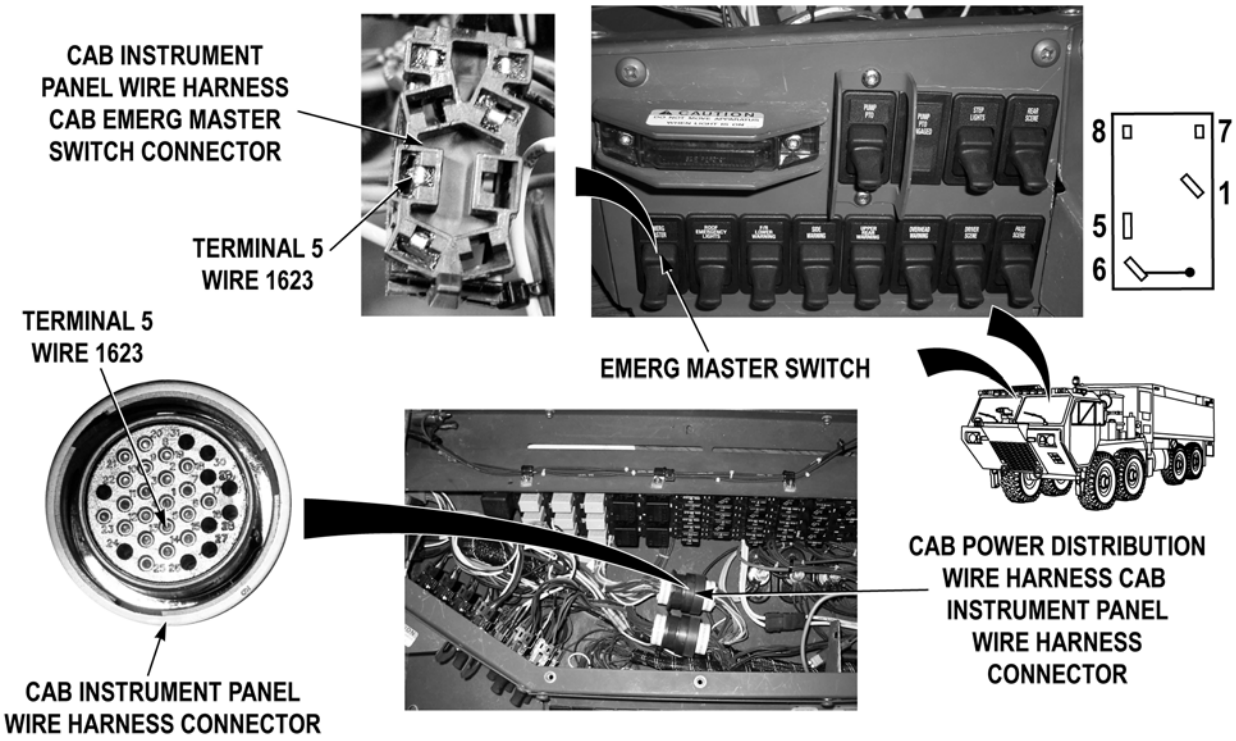
If there is no continuity, replace circuit breaker FS 13 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 4. Install circuit breaker FS 13 (WP 0240). Remove cab instrument panel C (WP 0203). Disconnect cab instrument panel wire harness EMERG MASTER switch connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1623 (yellow) at EMERG MASTER switch connector, terminal 5 and a known good ground.

If 22 to 28 VDC are present, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

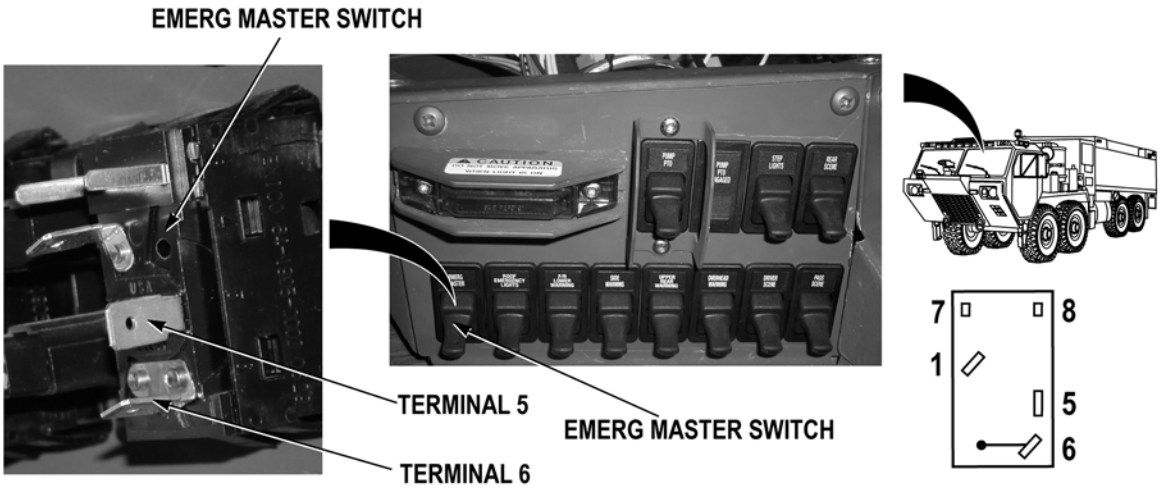


Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab power distribution wire harness cab instrument panel wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1623 (yellow) from cab instrument panel wire harness connector, terminal 5 to EMERG MASTER switch connector, terminal 5.

a. If there is continuity, repair wire 1623 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1623 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

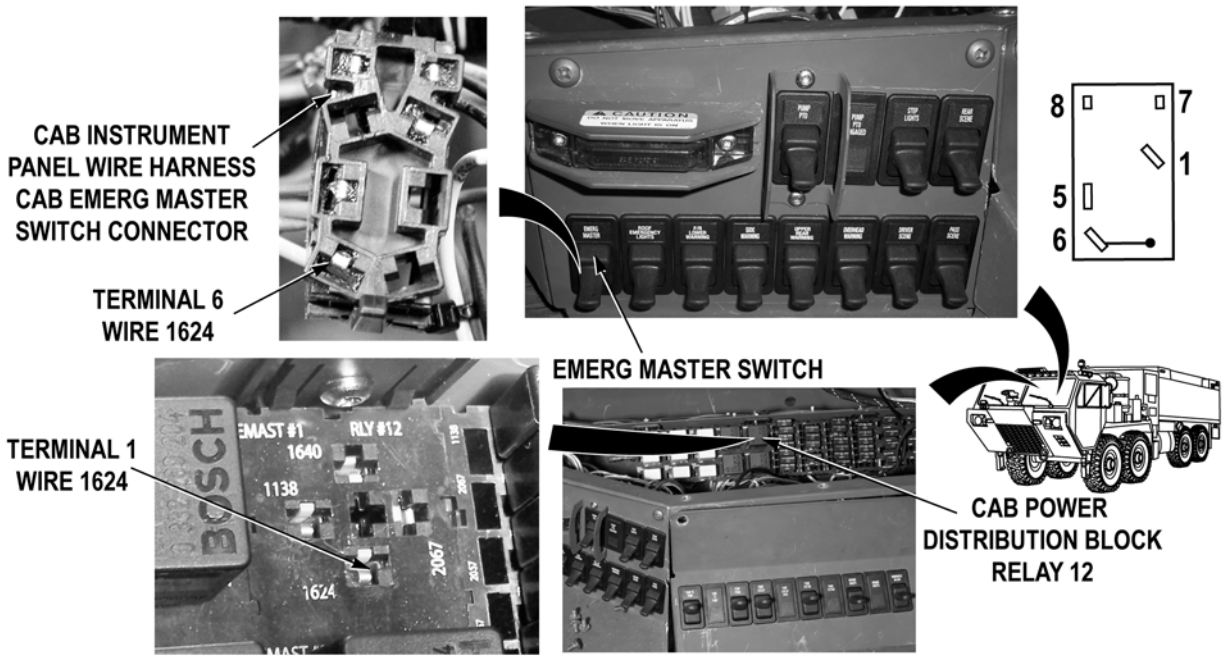
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Put EMER MASTER switch to on position (WP 0004). Check for continuity across EMERG MASTER switch, from terminal 5 to terminal 6 when switch is in on position.

If there is no continuity, replace EMERG MASTER switch (WP 0197).

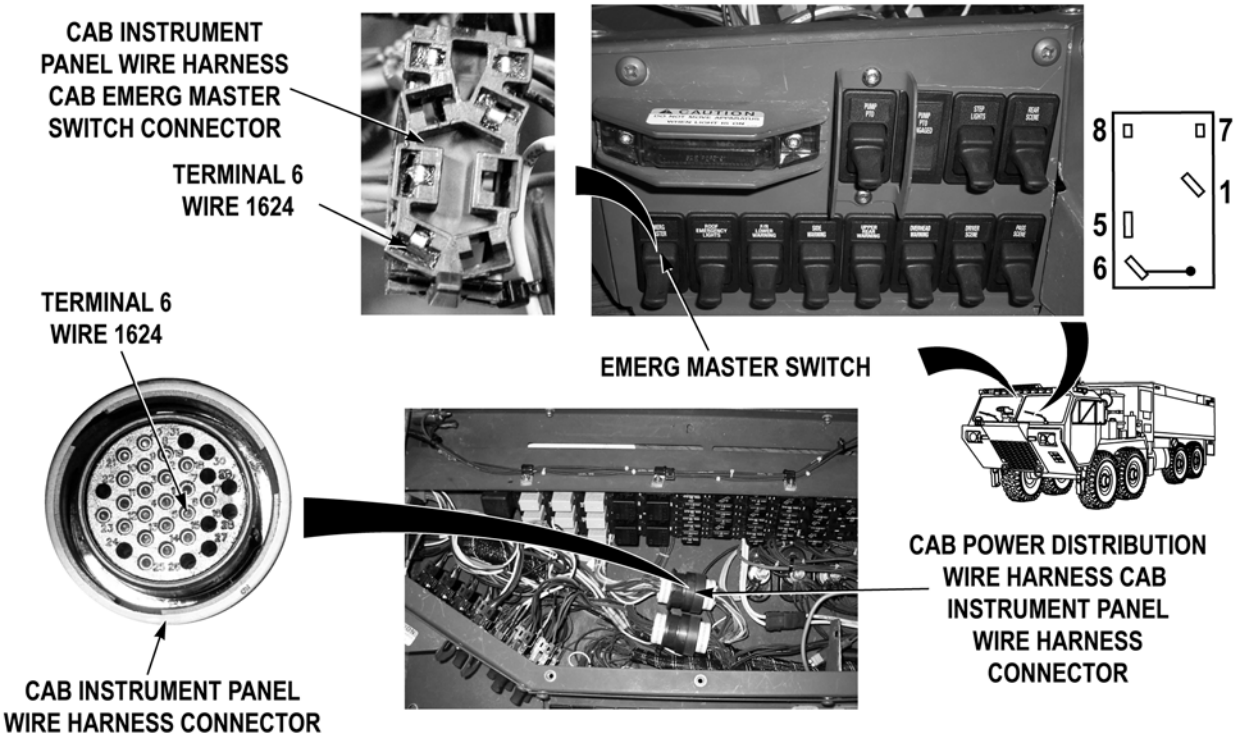
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Remove relay 12 from cab power distribution block (WP 0242). Check for continuity across cab power distribution wire harness wire 1624 (yellow) from EMERG MASTER switch connector, terminal 6 to relay 12 connector, terminal 1.

If there is continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

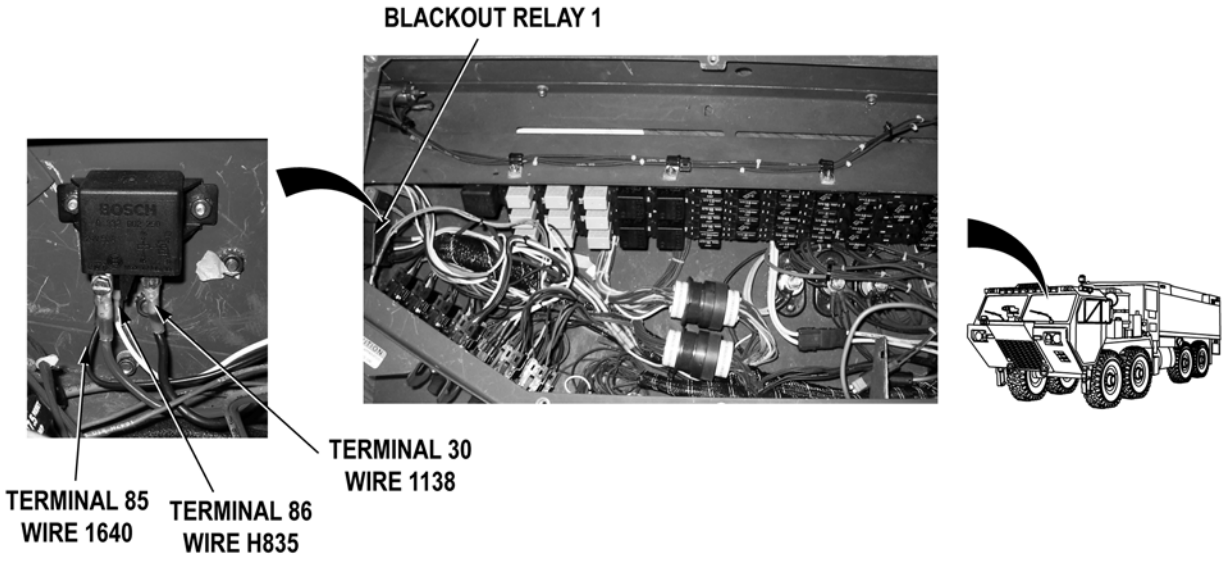


Step 8. Disconnect cab power distribution wire harness cab instrument panel wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1624 (yellow) from EMERG MASTER switch connector, terminal 6 to cab instrument panel wire harness connector, terminal 6.

a. If there is continuity, repair wire 1624 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1624 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Wire numbers with H prefix indicates that circuit is an extension of a HEMTT circuit.

Step 9. Close compartment door (WP 0008). Remove cab instrument panel A (WP 0203). Check for 22 to 28 VDC between cab instrument panel wire harness wire H835 (white) at blackout relay 1, terminal 86 and a known good ground.

If 22 to 28 VDC are not present, repair wire H835 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

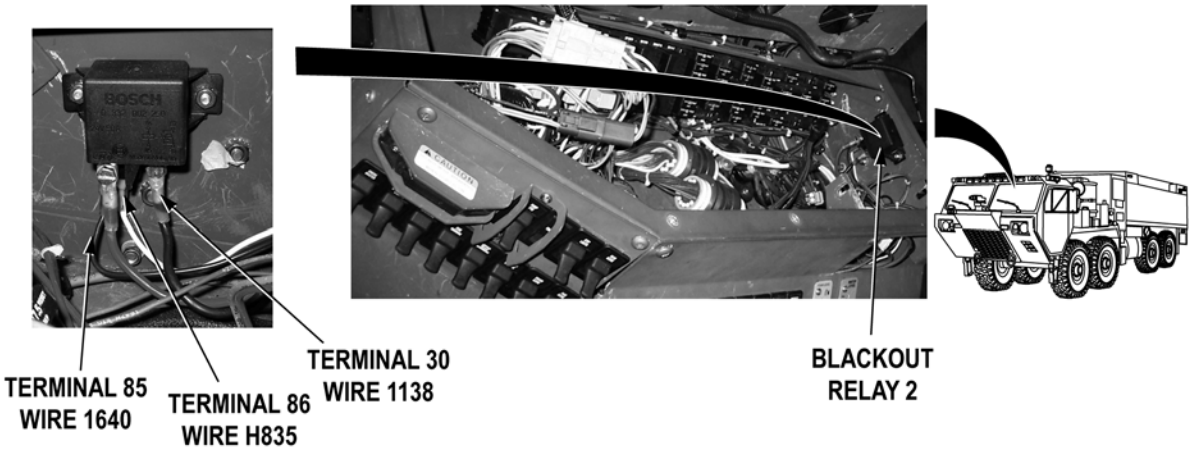
Step 10. Check for 22 to 28 VDC between cab instrument panel wire harness wire 1138 (red) at blackout relay 1, terminal 30 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1138 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 11. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab instrument panel wire harness wire 1640 (black) from blackout relay 1, terminal 85 to a known good ground.

If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Check for 22 to 28 VDC between cab instrument panel wire harness wire H835 (white) at blackout relay 2, terminal 86 and a known good ground.

If 22 to 28 VDC are not present, repair wire H835 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

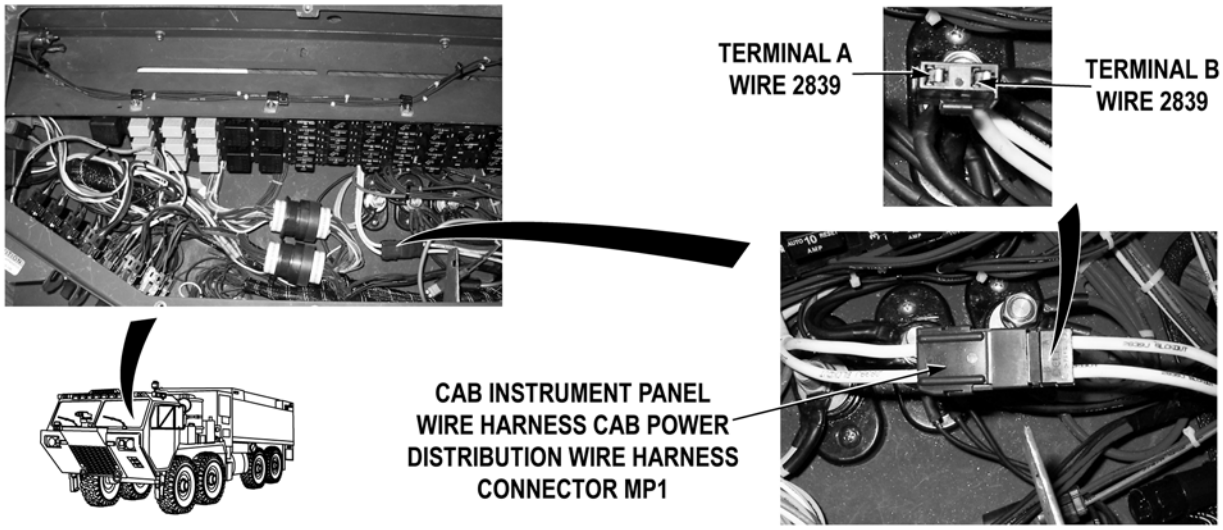
Step 13. Check for 22 to 28 VDC between cab instrument panel wire harness wire 1138 (red) at blackout relay 2, terminal 30 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1138 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 14. Check for continuity across cab instrument panel wire harness wire 1640 (black) from blackout relay 2, terminal 85 to a known good ground.

If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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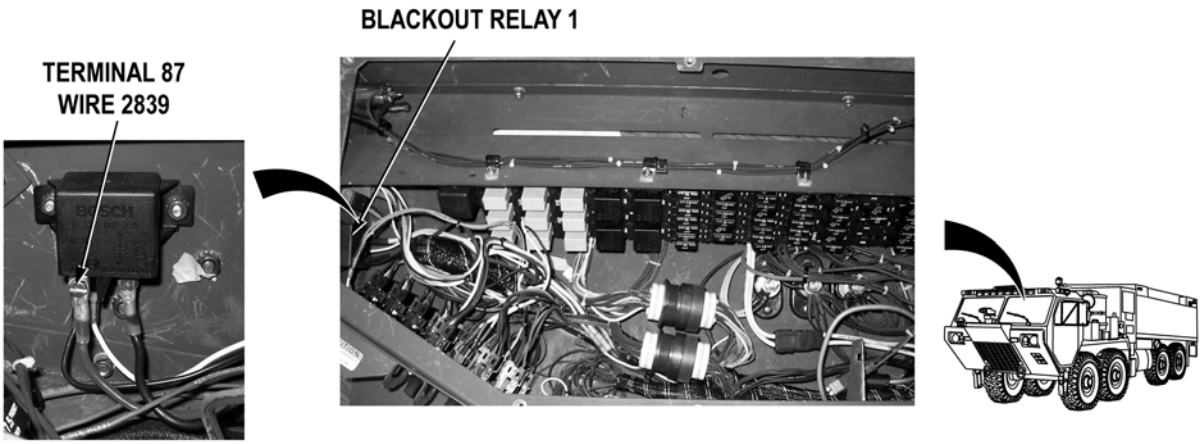
Step 15. Disconnect cab instrument panel wire harness connector MP1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between cab instrument panel wire harness wire 2839 (white) at connector MP1, terminal A and a known good ground.

If 22 to 28 VDC are not present, go to Step 17.

Step 16. Check for 22 to 28 VDC between cab instrument panel wire harness wire 2839 (white) at connector MP1, terminal B and a known good ground.

If 22 to 28 VDC are present, repair wire 2839 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

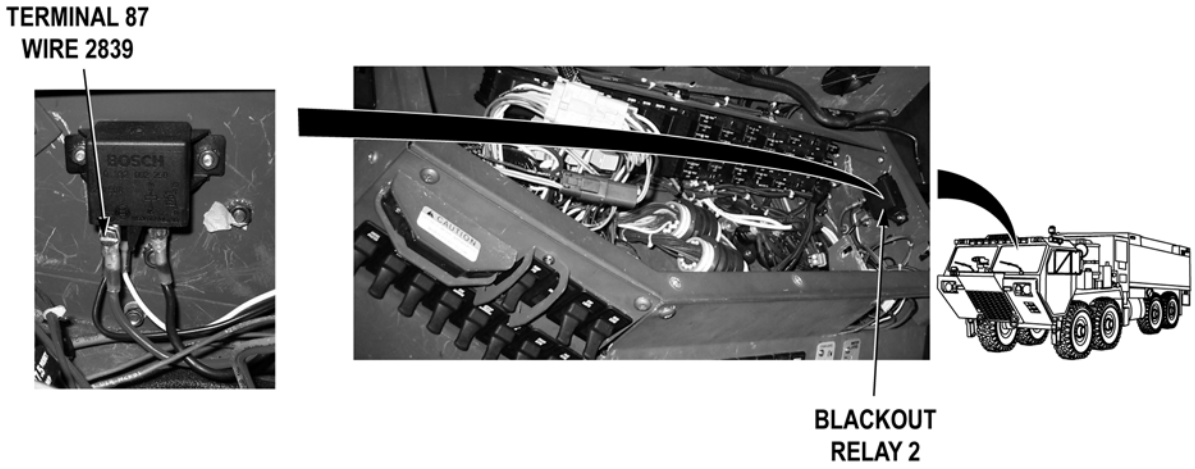
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Check for 22 to 28 VDC between blackout relay 1, wire 2839 (white) terminal 87 and a known good ground.

If 22 to 28 VDC are not present, replace blackout relay 1 (WP 0238).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Check for 22 to 28 VDC between blackout relay 2, wire 2839 (white) terminal 87 and a known good ground.

a. If 22 to 28 VDC are present, repair wire 2839 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If 22 to 28 VDC are not present, replace blackout relay 2 (WP 0238).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WARNING LIGHTS (FRONT AND REAR LOWER) DO NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0098
WP 0194
WP 0197
WP 0203
WP 0229

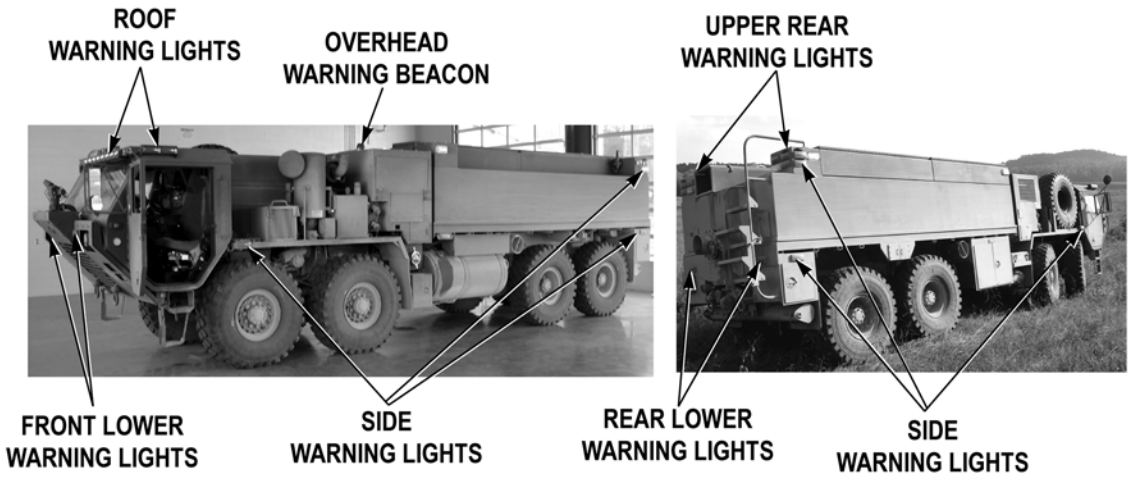
References (continued)
WP 0240
WP 0242
WP 0279
WP 0280
WP 0287
WP 0293
WP 0299

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING LIGHTS (FRONT AND REAR LOWER) DO NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if at least one front or rear lower warning light operates.

If at least one front or rear lower warning light operates, go to Step 12.

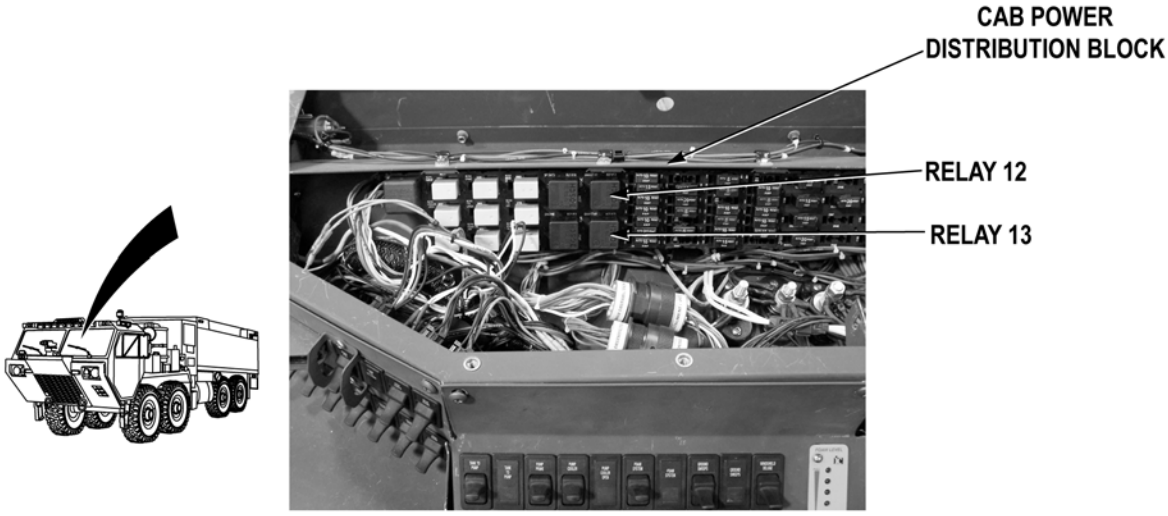
Step 2. Put ROOF EMERGENCY LIGHTS or SIDE WARNING switch to on position (WP 0004). Check if roof or side warning lights operate.

If roof or side warning lights operate, go to Step 5.

Step 3. Put OVERHEAD WARNING or UPPER REAR WARNING switch to on position (WP 0004). Check if overhead warning beacon or upper rear warning lights operate.

If overhead warning beacon and upper rear warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0098).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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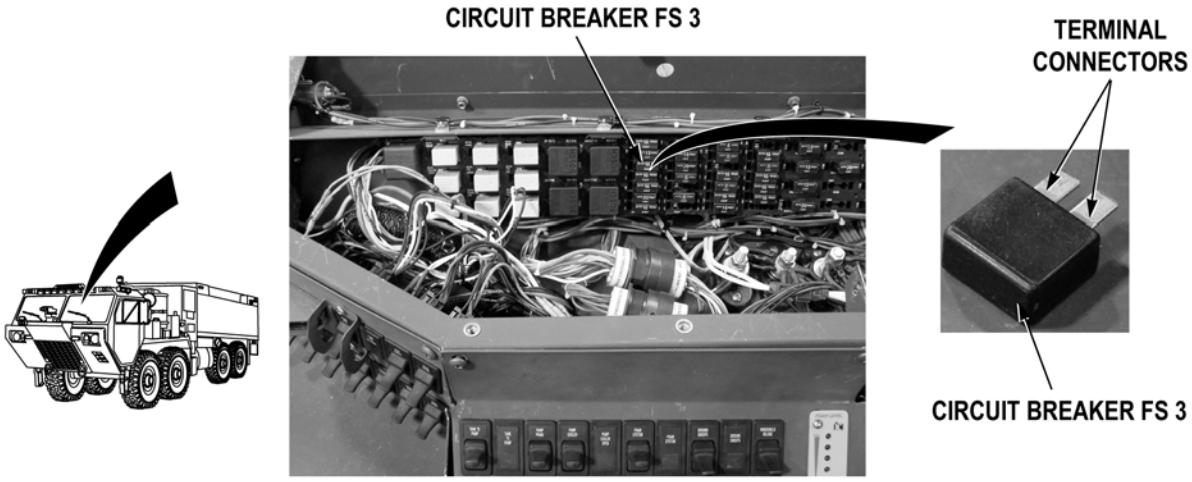
Step 4. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, SIDE WARNING, UPPER REAR WARNING and OVERHEAD WARNING switches to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Swap relays 12 and 13 (WP 0242). Push battery disconnect switch to on position (WP 0007). Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if front and rear lower warning lights operate.

a. If front and rear lower warning lights operate, return relays to original positions and replace relay 12 (WP 0242).

b. If front and rear lower warning lights do not operate, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 3 (WP 0240). Check for continuity across circuit breaker.

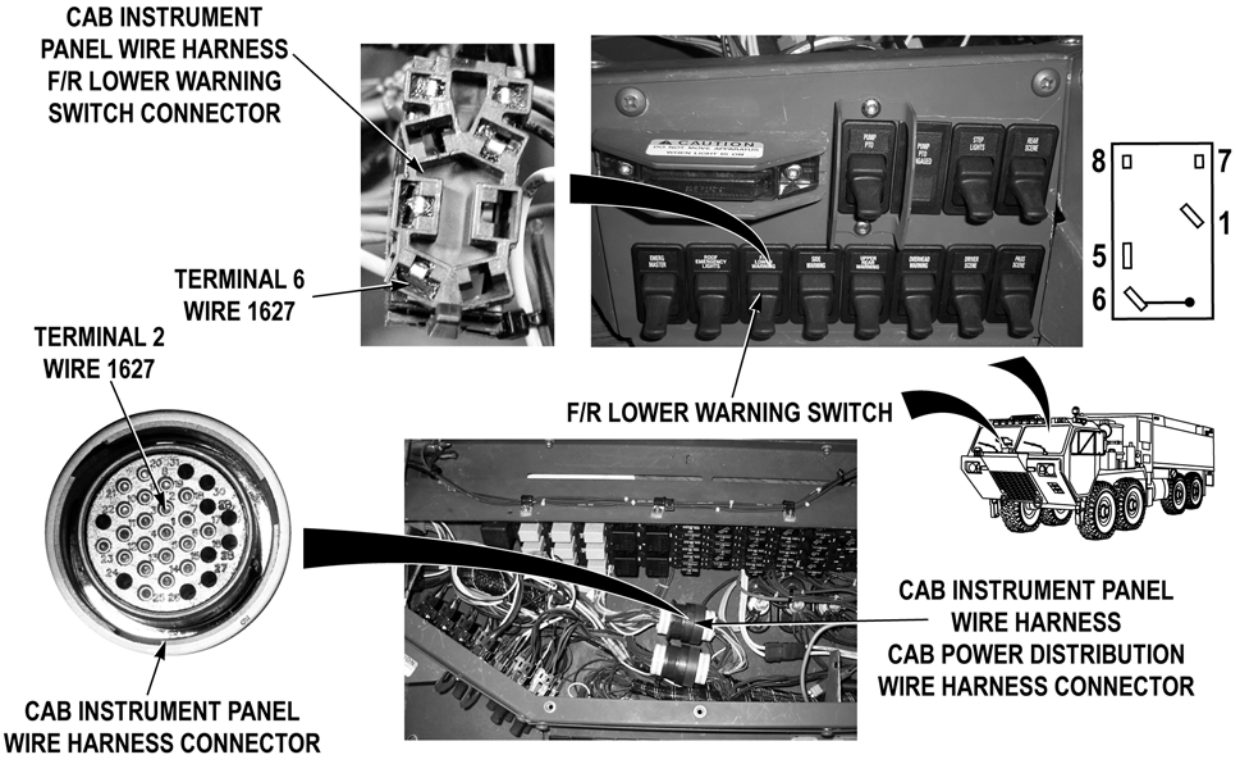
If there is no continuity, replace circuit breaker FS 3 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 6. Install circuit breaker FS 3 (WP 0240). Remove cab instrument panel C (WP 0203). Remove cab instrument panel wire harness F/R LOWER WARNING switch connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position. (WP 0004). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1627 (blue) at F/R LOWER WARNING switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

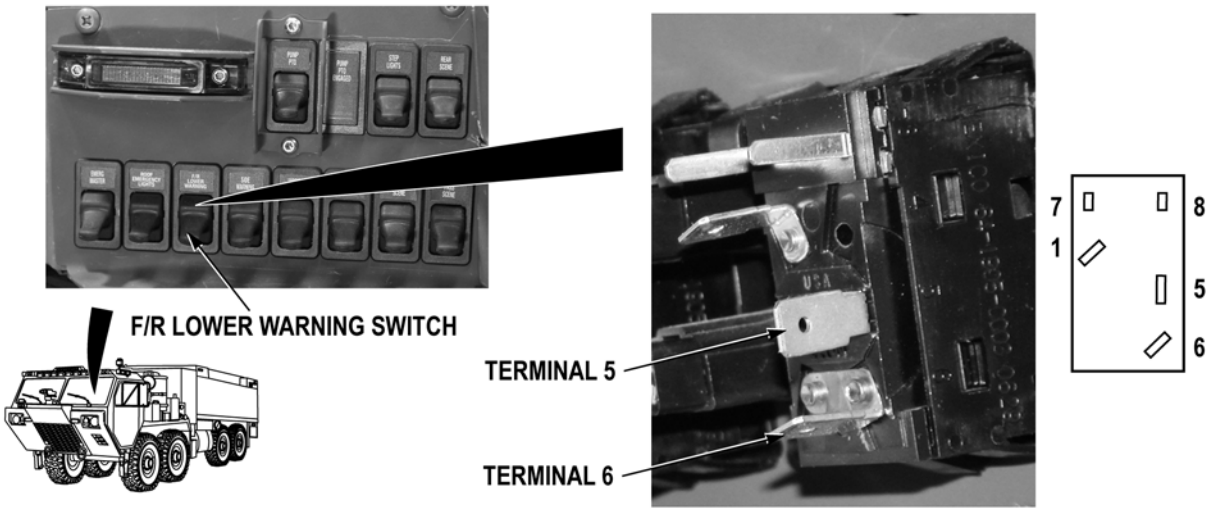


Step 7. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1627 (blue) from cab instrument panel wire harness connector, terminal 2 to F/R LOWER WARNING switch connector, terminal 6.

a. If there is continuity, repair wire 1627 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1627 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

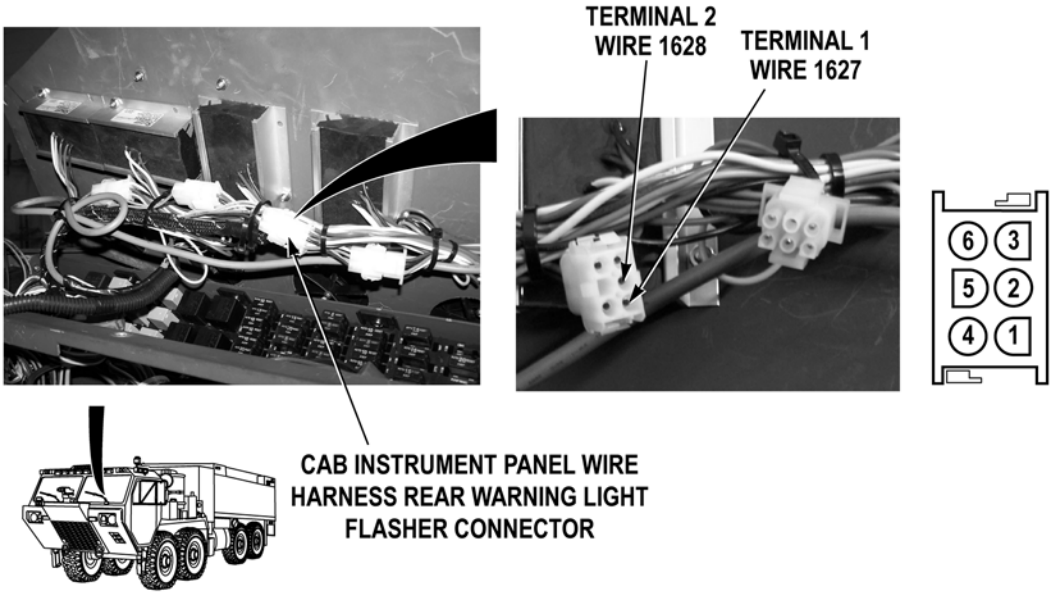
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Push battery disconnect switch to off position (WP 0007). Check for continuity across F/R LOWER WARNING switch, from terminal 5 to terminal 6, when switch is in on position.

If there is no continuity, replace F/R LOWER WARNING switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

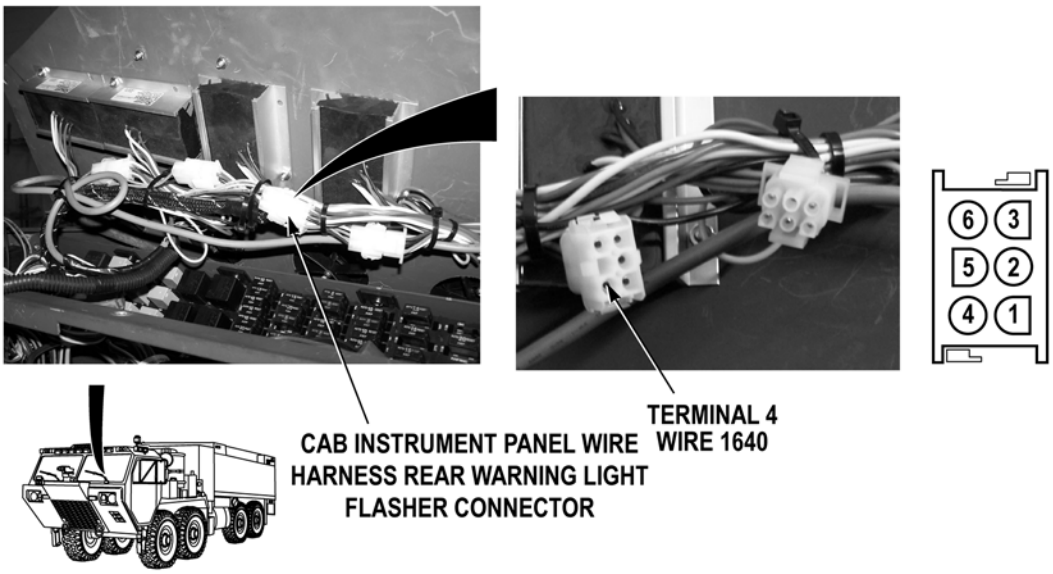
Step 9. Install cab instrument panel wire harness F/R LOWER WARNING switch connector. Disconnect cab instrument panel wire harness front and rear warning light flasher connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire 1627 (blue) at front and rear lower warning light flasher connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1627 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 10. Put F/R LOWER WARNING switch to on position (WP 0004). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1628 (blue) at front and rear lower warning light flasher connector, terminal 2 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1628 in cab instrument panel harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

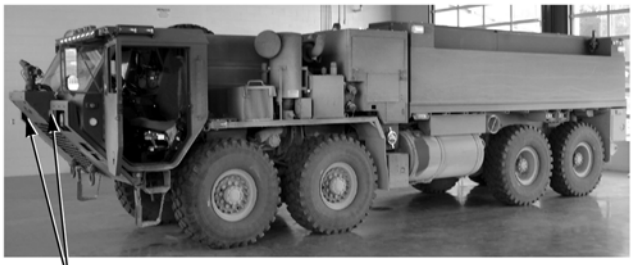


Step 11. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 1640 (black) from cab instrument panel wire harness front and rear lower warning light flasher connector, terminal 4 to a known good ground.

a. If there is continuity, replace front and rear lower warning light flasher unit (WP 0194).

b. If there is no continuity, repair wire 1640 in cab instrument panel if repairable (TM 9-2320-315-14&P), or replace cab instrument panel harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Check if driver side front and rear lower warning lights operate.

If both driver side front and rear lower warning lights operate, go to Step 22.

Step 13. Check if driver side front or rear lower warning lights operate.

If both driver side front and rear lower warning lights do not operate, go to Step 24.

Step 14. Check if driver side front lower warning light operates.

If driver side front lower warning light operates, go to Step 18.

Step 15. Check if passenger side front lower warning light operates.

If passenger side front lower warning light does not operate, repair wire 1640 if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

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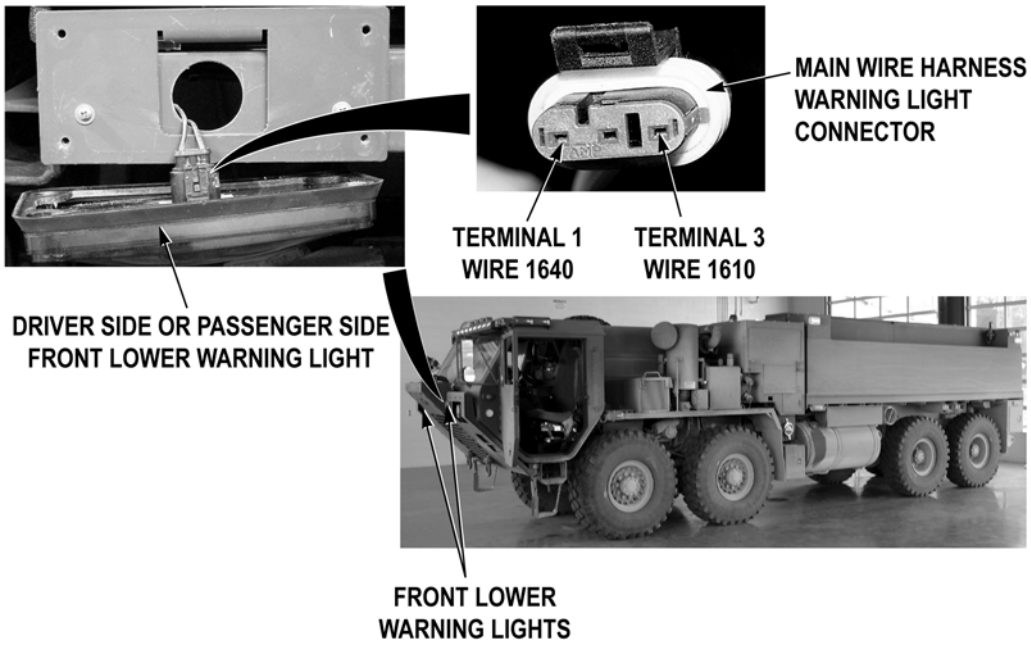
Step 16. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Remove a known operating warning light. Remove non-operating front lower warning light (WP 0229). Replace non-operating front lower warning light with known operating warning light. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if known operating warning light operates in non-operating warning light position.

If known operating warning light operates in non-operating warning light position, replace non-operating warning light (WP 0229).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Install warning lights to original positions (WP 0229). Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove non-operating front lower warning light (WP 0229). With a test lead set, check for continuity across main wire harness wire 1640 (black) from main wire harness warning light connector, terminal 1 to a known good ground.

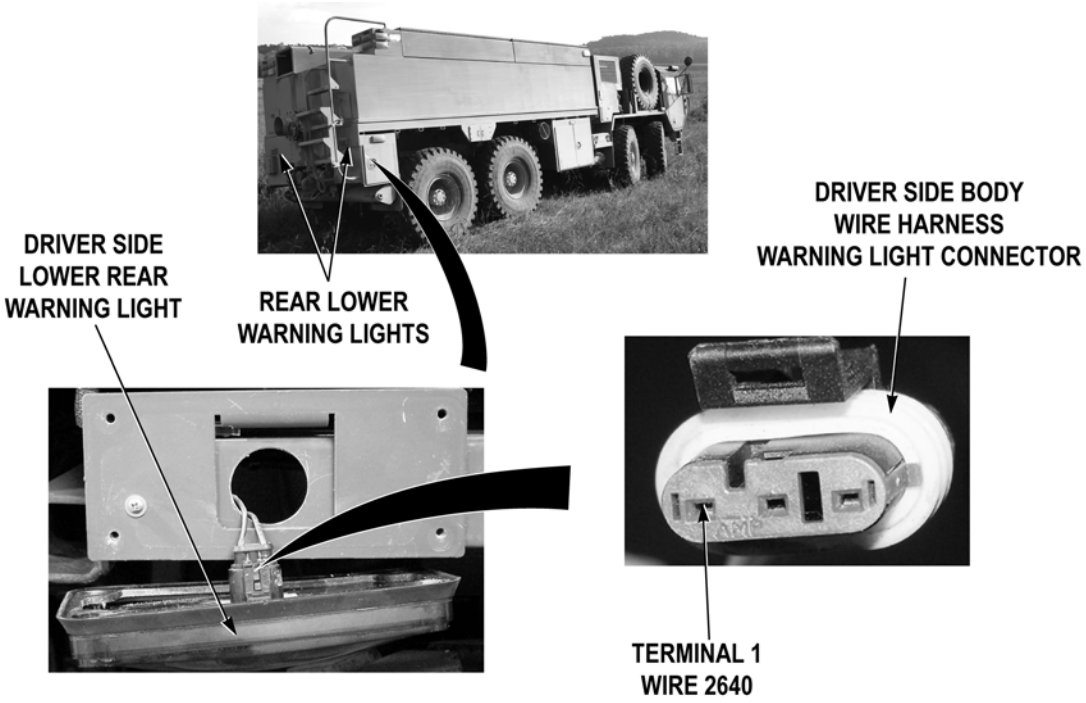
a. If there is continuity, repair wire 1610 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 18. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Remove a known operating warning light. Remove non-operating rear lower warning light (WP 0229). Replace non-operating rear lower warning light with a known operating warning light. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if known operating warning light operates in non-operating warning light position.

If known operating warning light operates in non-operating warning light position, replace non-operating warning light (WP 0229).

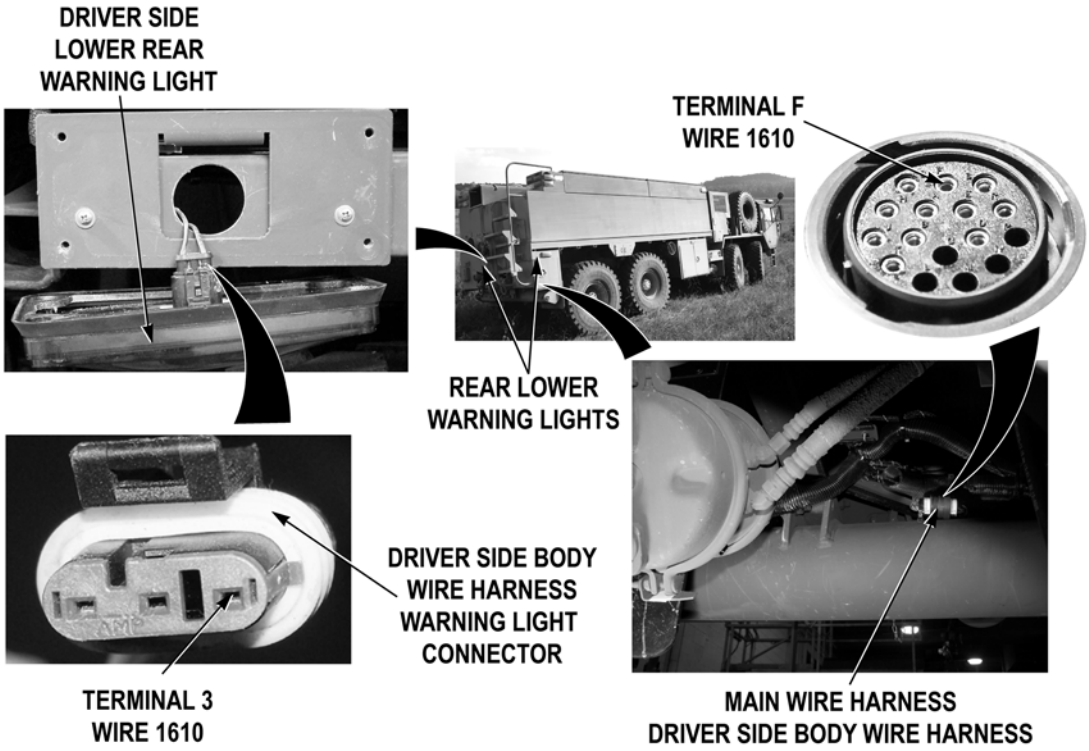
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Install warning lights to original positions (WP 0229). Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove driver side rear lower warning light (WP 0229). With a test lead set, check for continuity across driver side body wire harness wire 2640 (black) from driver side body wire harness warning light connector, terminal 1 to a known good ground.

If there is no continuity, go to Step 21.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

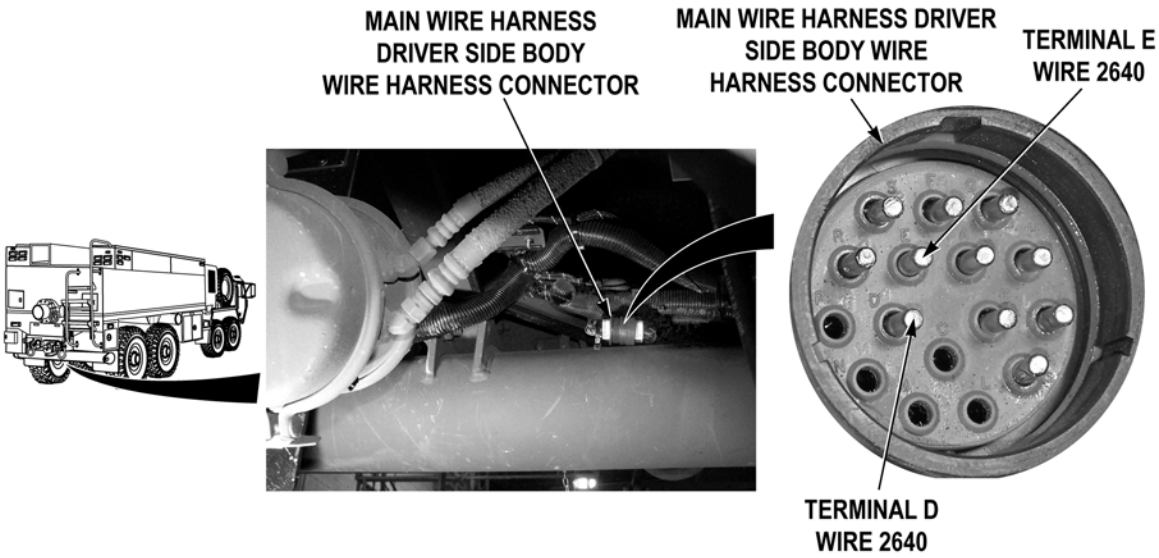


Step 20. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across driver side body wire harness wire 1610 (black) from driver side body wire harness warning light connector, terminal 3 to main wire harness driver side body wire harness connector, terminal F.

a. If there is continuity, repair wire 1610 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1610 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

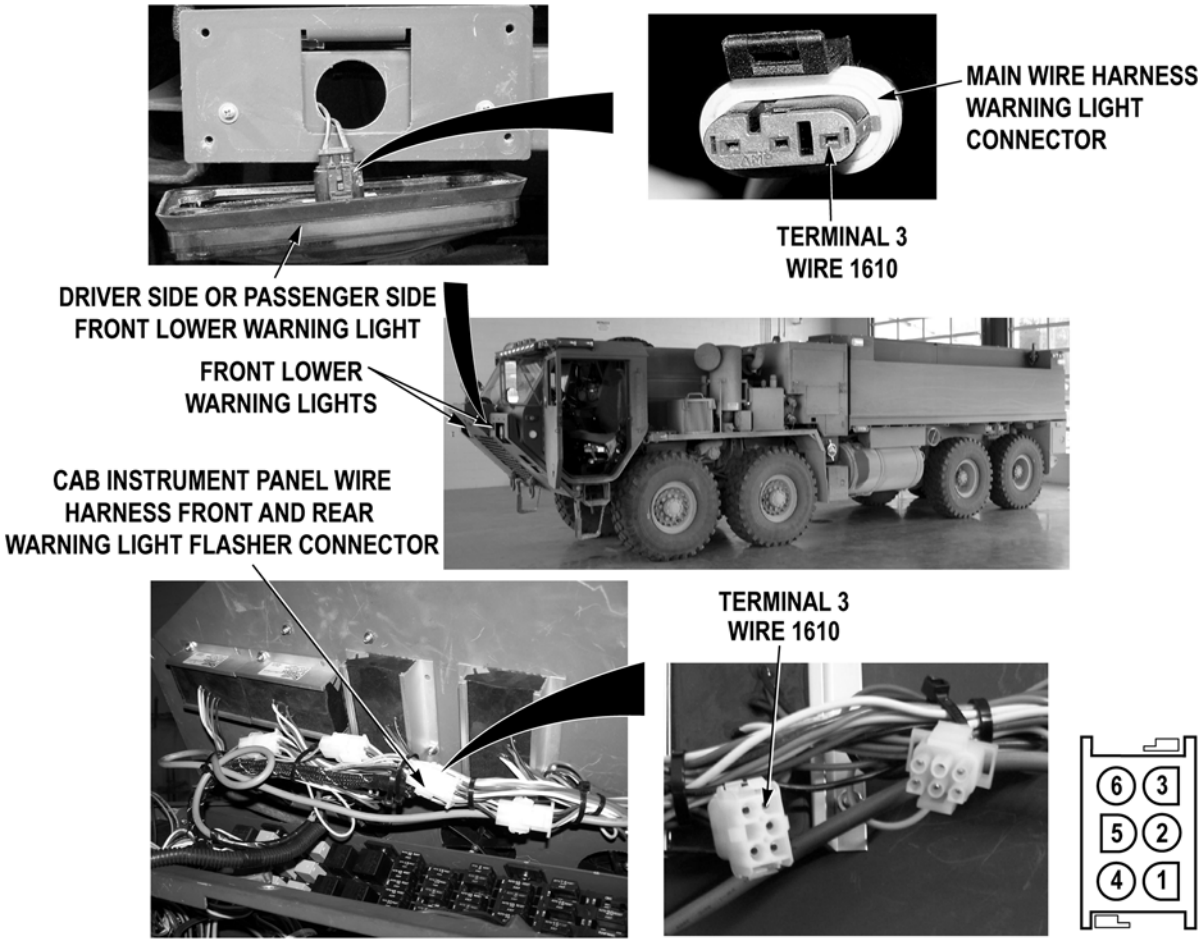
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 21. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2640 (black) from main wire harness driver side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body harness (WP 0287).

b. If there is no continuity at either terminal, repair wire 2640 in main wire harness repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

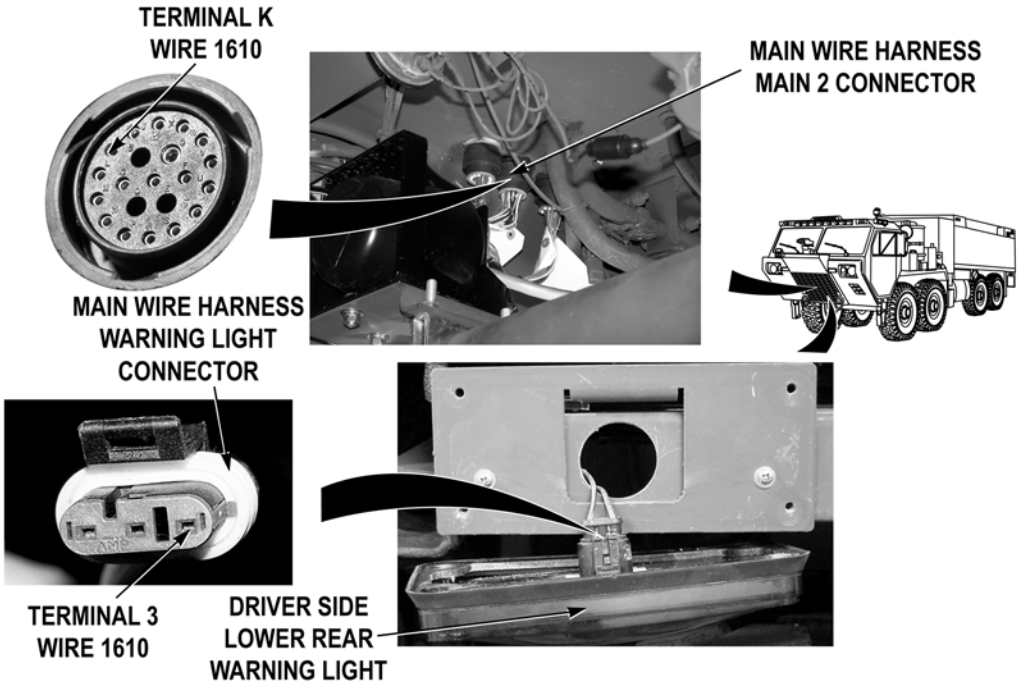
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 22. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove driver side front lower warning light (WP 0229). Remove cab instrument panel A (WP 0203). Disconnect cab instrument panel wire harness front and rear warning light flasher connector. With a test lead set, check for continuity across wire 1610 (black) from main wire harness warning light connector, terminal 3 to cab instrument panel wire harness front and rear lower warning light flasher connector, terminal 3.

If there is continuity, replace front and rear lower warning light flasher unit (WP 0194).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 23. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 1610 (black) from main wire harness warning light connector, terminal 3 to main wire harness main 2 connector, terminal K.

a. If there is continuity, repair wire 1610 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1610 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 24. Check if passenger side front or rear lower warning light operates.

If both passenger side front and rear lower warning lights do not operate, go to Step 28.

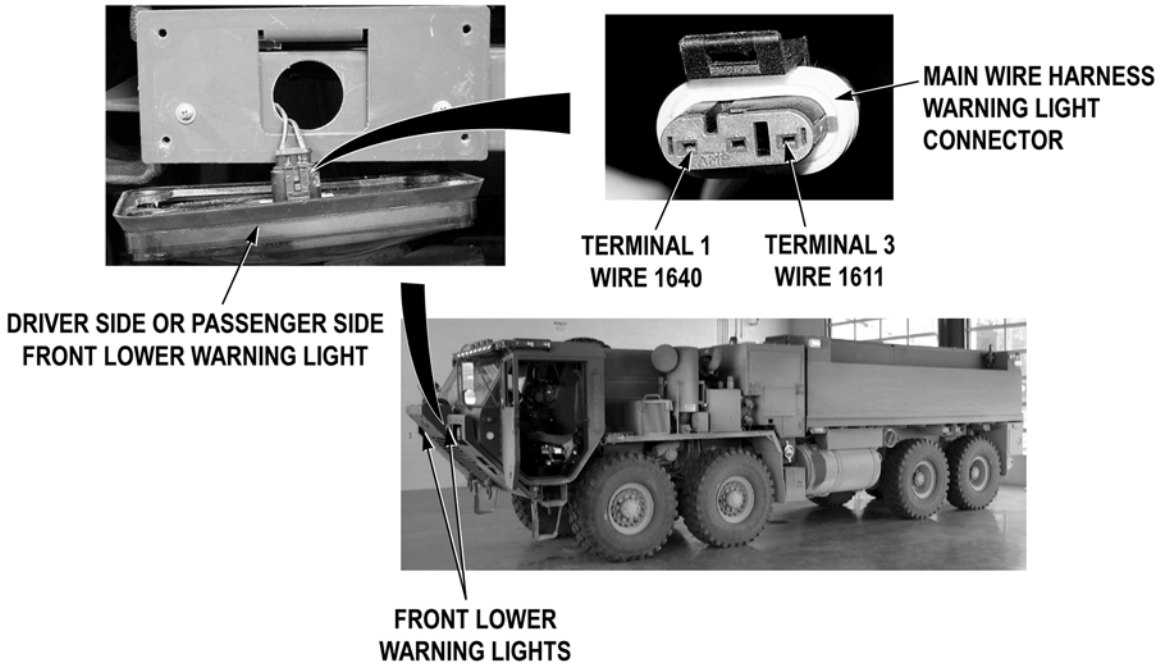
Step 25. Check if passenger side front lower warning light operates.

If passenger side front lower warning light operates, go to Step 31.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 26. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Remove a known operating warning light. Remove non-operating front lower warning light (WP 0229). Replace non-operating front lower warning light with operating warning light. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and F/R LOWER WARNING switch to on position (WP 0004). Check if known operating warning light operates in non-operating warning light position.

If known operating warning light operates in non-operating warning light position, replace non-operating warning light (WP 0229).



Step 27. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove non-operating front lower warning light (WP 0229). With a test lead set, check for continuity across main wire harness wire 1640 (black) from warning light connector, terminal 1 to a known good ground.

a. If there is continuity, repair wire 1611 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

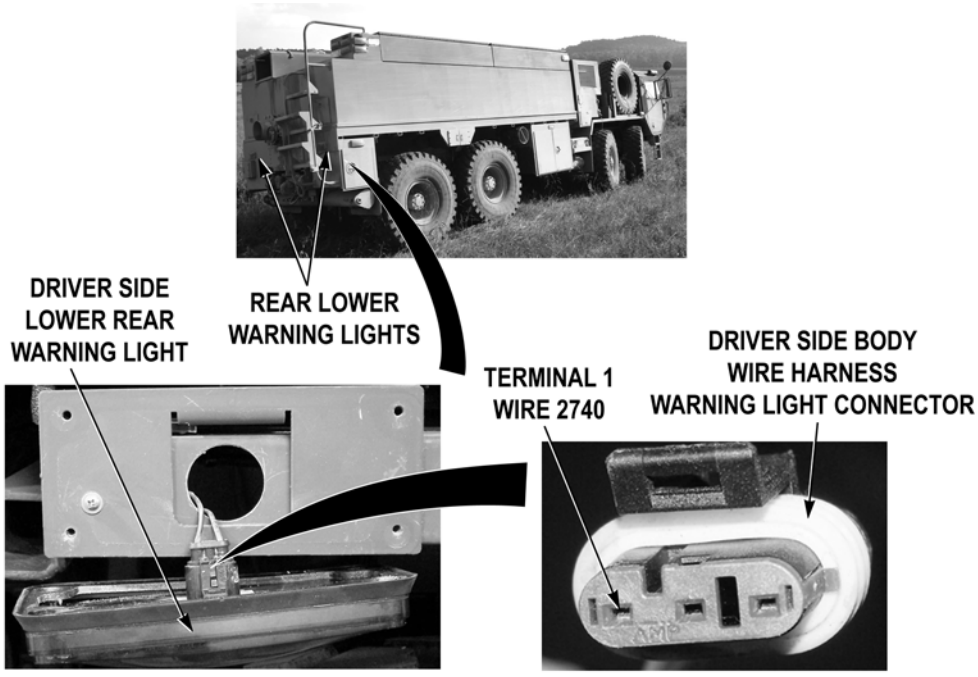
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 28. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Remove a known operating warning light. Remove non-operating rear warning light (WP 0229). Replace non-operating rear warning light with operating warning light. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and F/R LOWER WARNING switch to on position (WP 0004). Check if known operating warning light operates in non-operating warning light position.

If known operating warning light operates in non-operating warning light position, replace non-operating warning light (WP 0229).

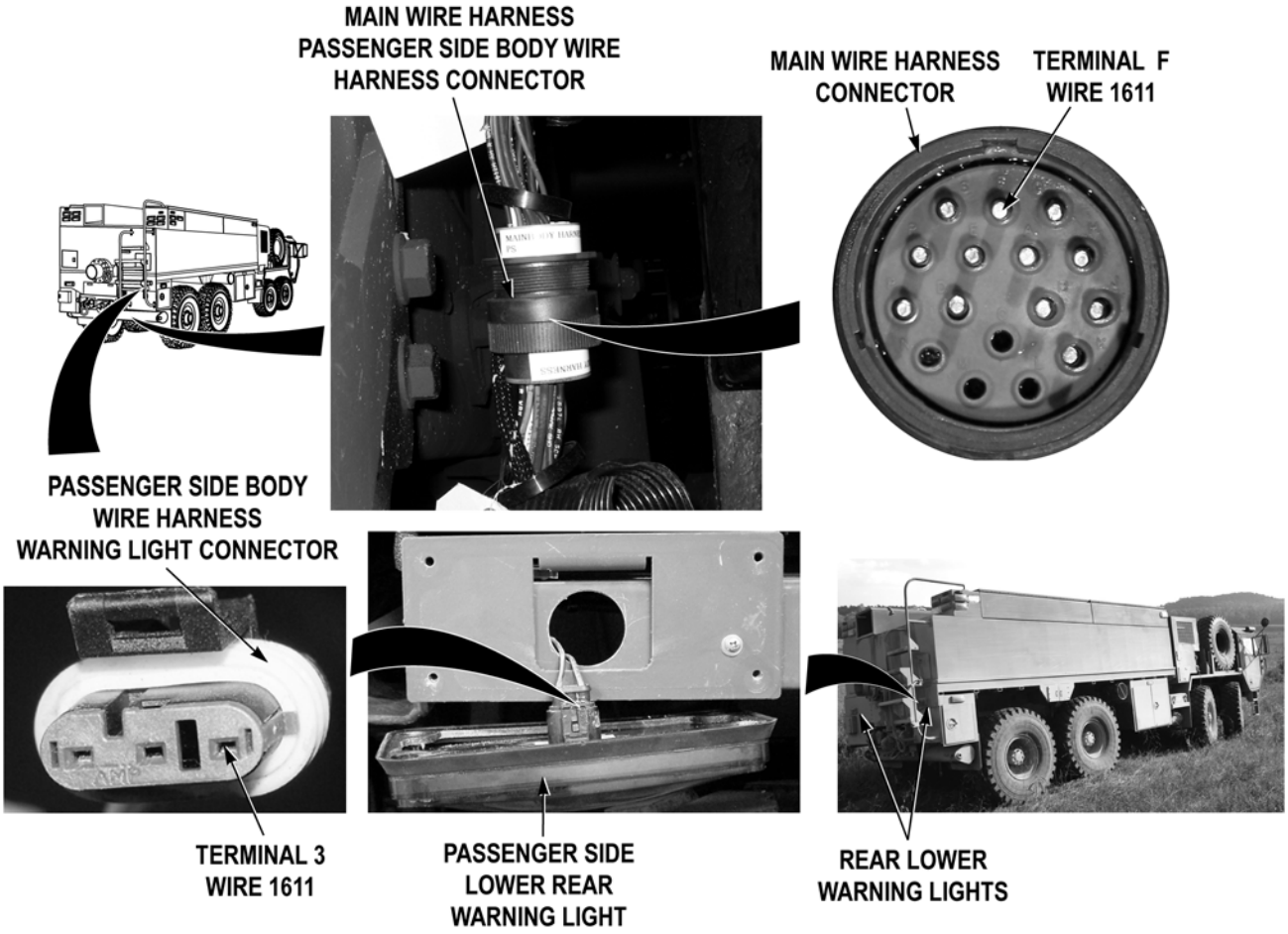
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 29. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove non-operating rear warning light (WP 0229). With a test lead set, check for continuity across passenger side body wire harness wire 2740 (black) from warning light connector, terminal 1 to a known good ground.

If there is no continuity, go to Step 32.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

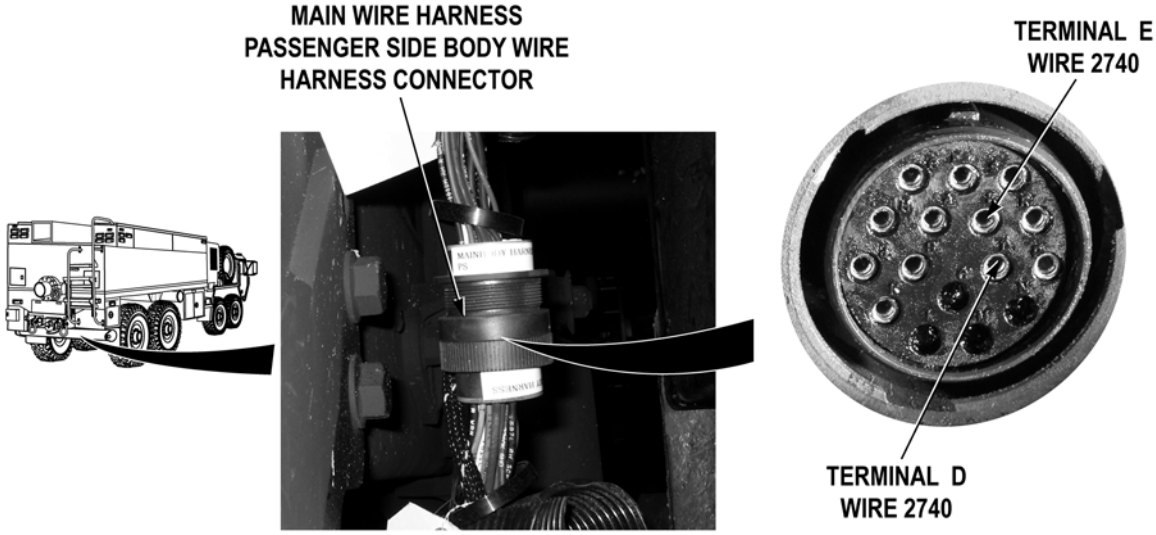


Step 30. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across passenger side body wire harness wire 1611 (white) from passenger side body wire harness warning light connector, terminal 3 to main wire harness passenger side body wire harness connector, terminal F.

a. If there is continuity, repair wire 1611 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1611 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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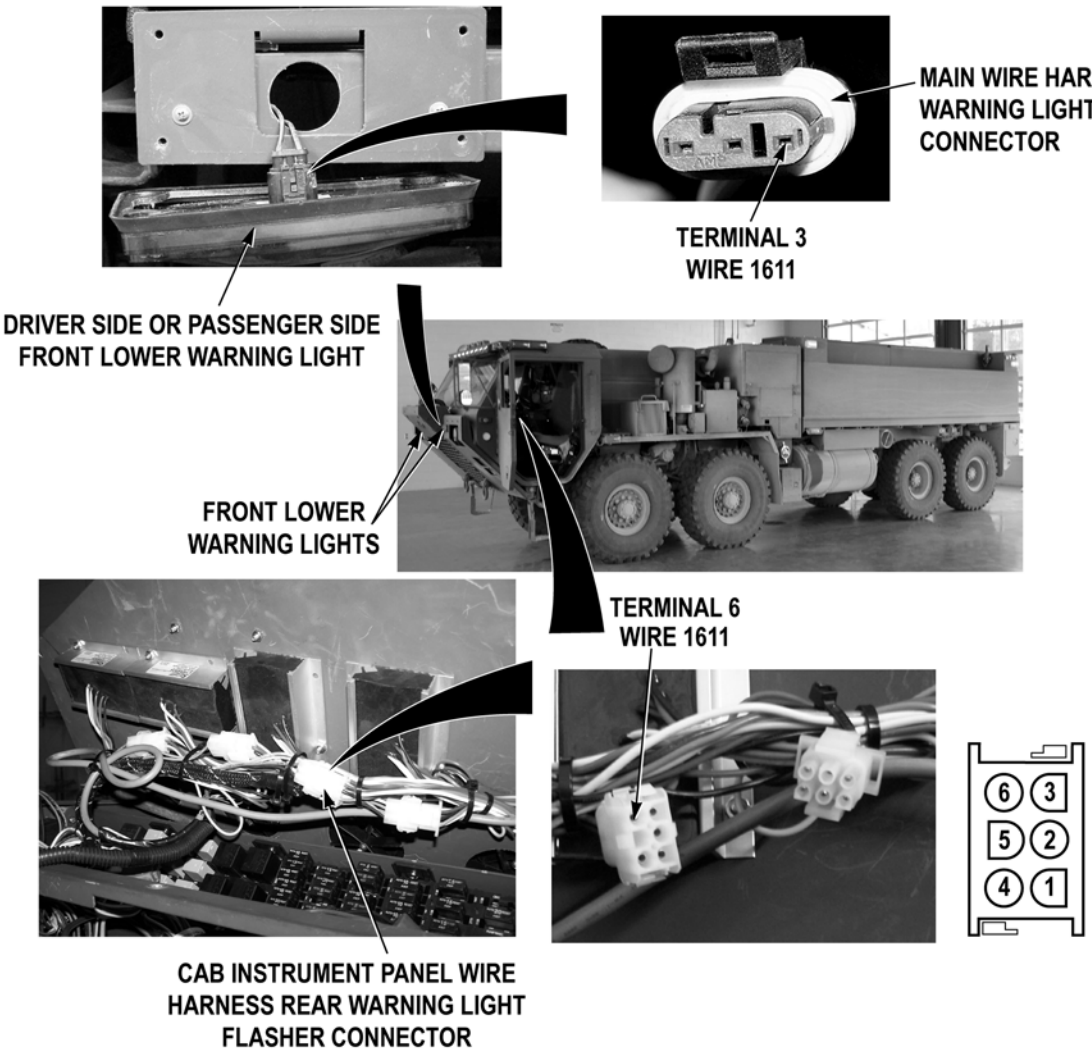
Step 31. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from main wire harness passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740, in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

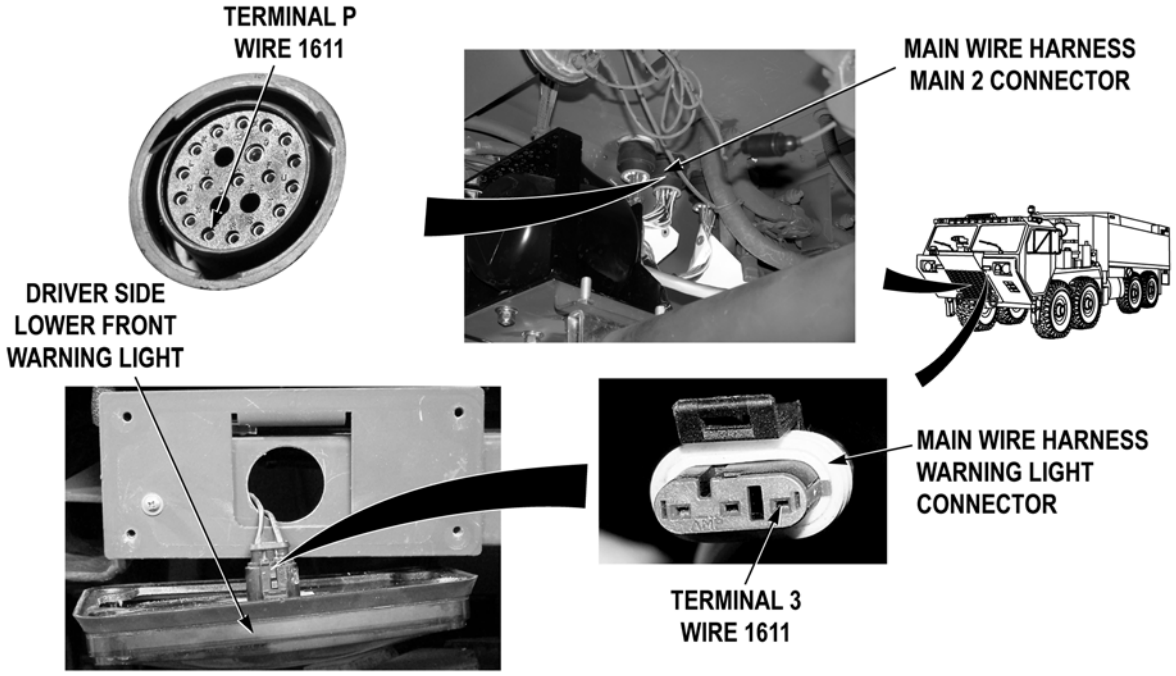
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 32. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove passenger side front warning light (WP 0229). Remove cab instrument panel A (WP 0194). Disconnect cab instrument panel wire harness front and rear warning light flasher connector. With a test lead set, check for continuity across wire 1611 (white) from main wire harness warning light connector, terminal 3 to cab instrument panel wire harness front and rear warning light flasher connector, terminal 6.

If there is continuity, replace front and rear warning light flasher unit (WP 0194).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 33. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 1611 (white) from warning light connector, terminal 3 to main wire harness main 2 connector, terminal P.

a. If there is continuity, repair wire 1611 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1611 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WARNING LIGHTS (OVERHEAD BEACON) DO NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

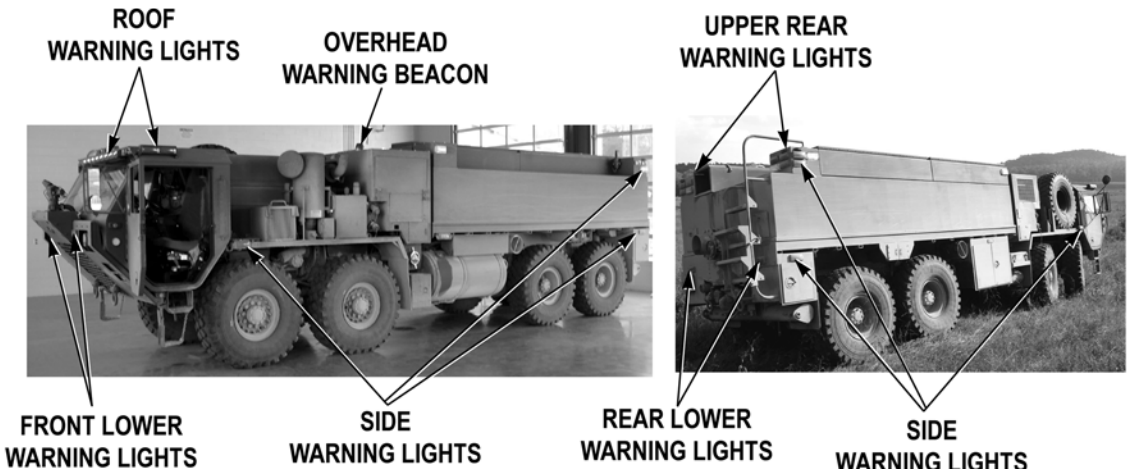
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0100
WP 0197
WP 0203

References (continued)
WP 0230
WP 0240
WP 0242
WP 0279
WP 0280
WP 0293

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING LIGHTS (OVERHEAD BEACON) DO NOT OPERATE



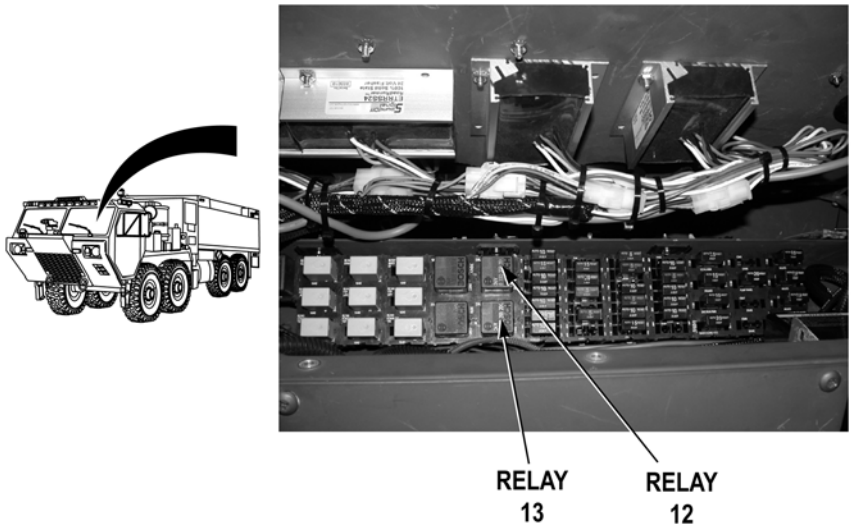
Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and UPPER REAR WARNING switches to on position (WP 0004). Check if upper rear warning lights operate.

If upper rear warning lights operate, go to Step 4.

Step 2. Put F/R LOWER WARNING, ROOF EMERGENCY LIGHTS, and SIDE WARNING switch to on position (WP 0004). Check if front, rear, roof, or side warning lights operate.

If front, rear, roof, and side warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0100).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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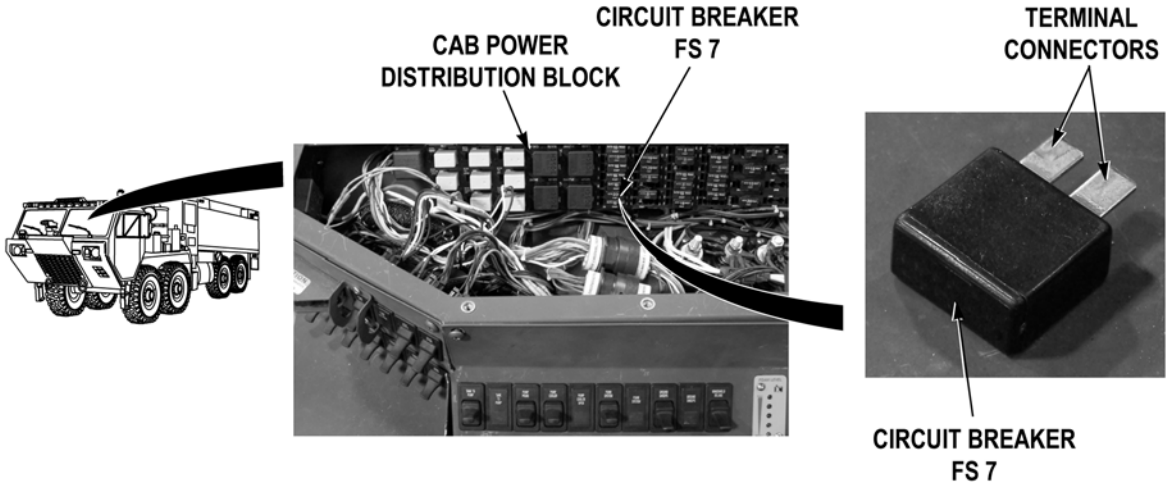
Step 3. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, SIDE WARNING, and UPPER REAR WARNING switches to off position (WP 0004). Remove cab instrument panel A (WP 0203). Swap relays 12 and 13 (WP 0242). Put EMERG MASTER and OVERHEAD WARNING switches to on position (WP 0004). Check if overhead warning beacon operates.

a. If overhead warning beacon operates, return relays to original positions and replace relay 13 (WP 0242).

b. If overhead warning beacon does not operate, replace cab power distribution wire harness and block (WP 0280).

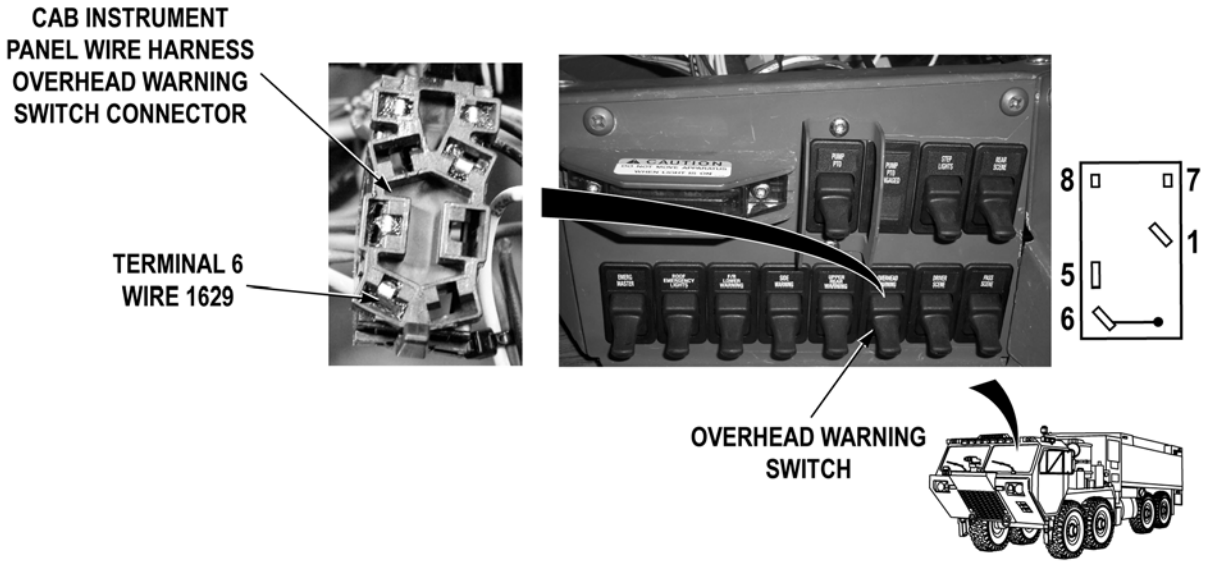
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 7 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 7 (WP 0240).

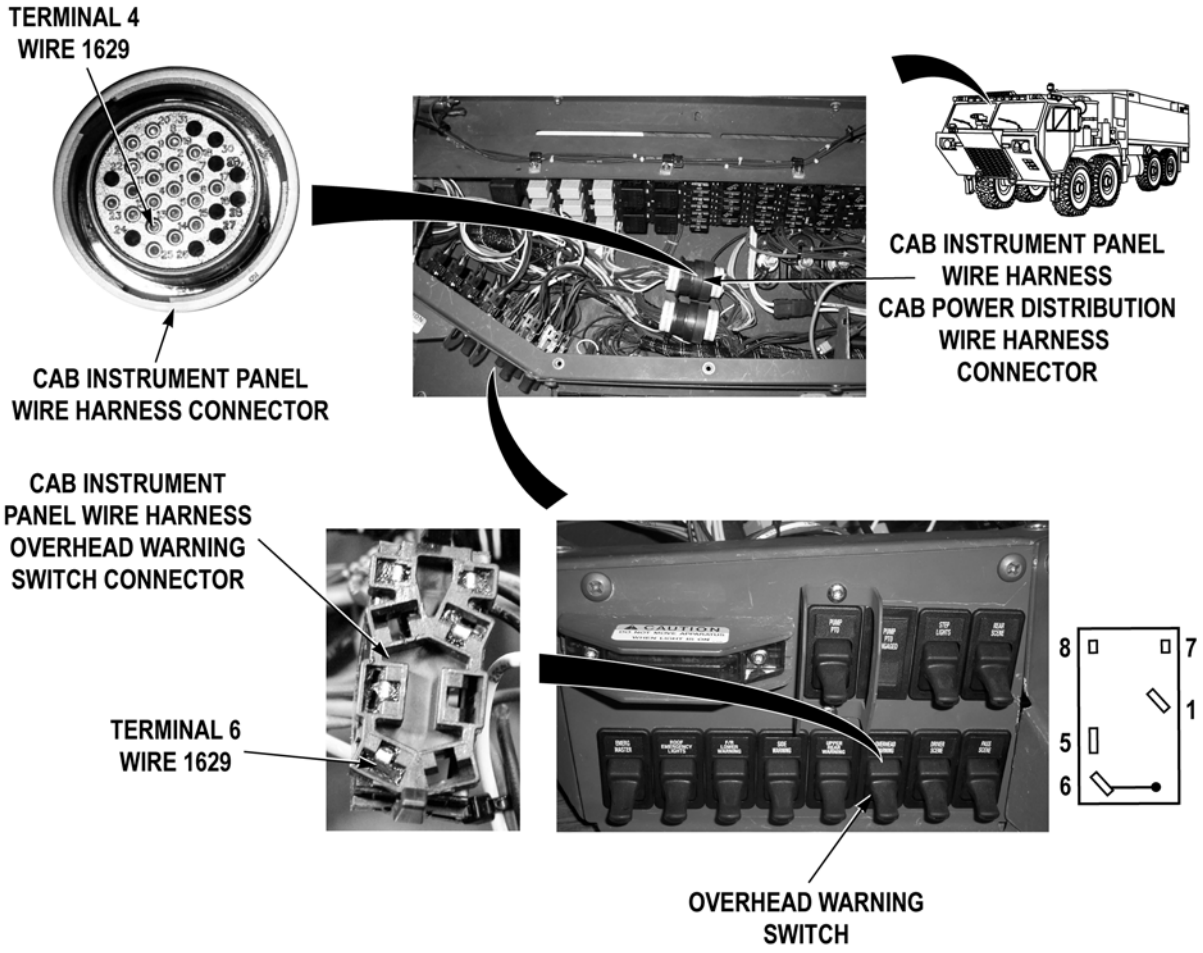
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Install circuit breaker FS 7 (WP 0240). Remove cab instrument panel C (WP 0203). Disconnect cab instrument panel wire harness OVERHEAD WARNING switch connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position. (WP 0004). With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire 1629 (green) at OVERHEAD WARNING switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

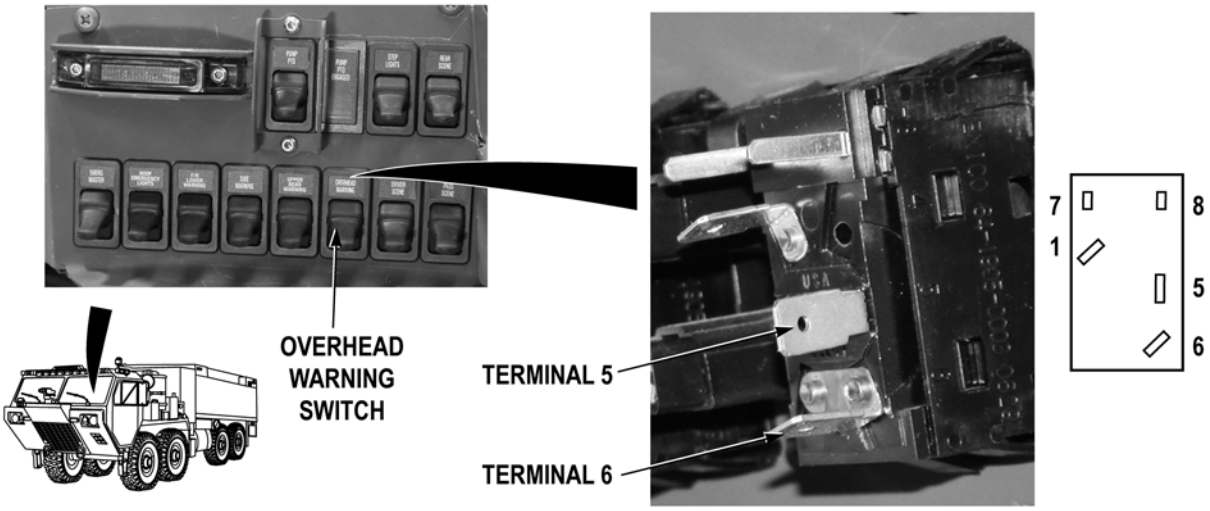


Step 6. Pull EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1629 (green) from cab instrument panel wire harness connector, terminal 4 to OVERHEAD WARNING switch connector, terminal 6.

a. If there is continuity, repair wire 1629 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

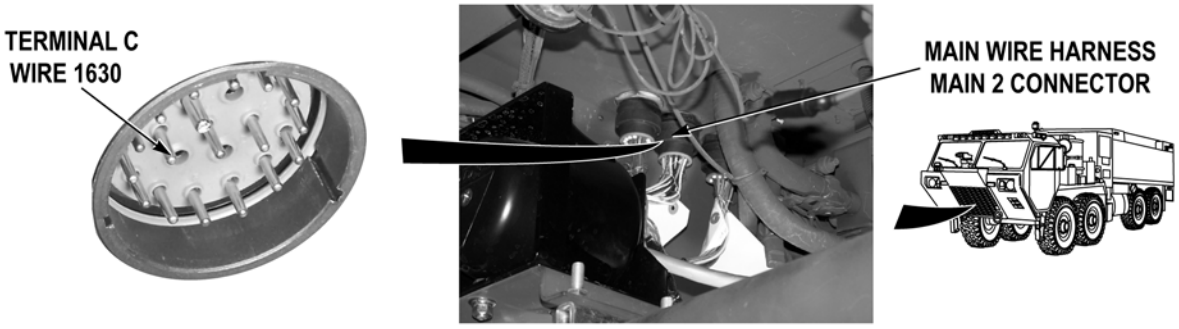
b. If there is no continuity, repair wire 1629 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across OVERHEAD WARNING switch, from terminal 5 to terminal 6, when switch is in on position.

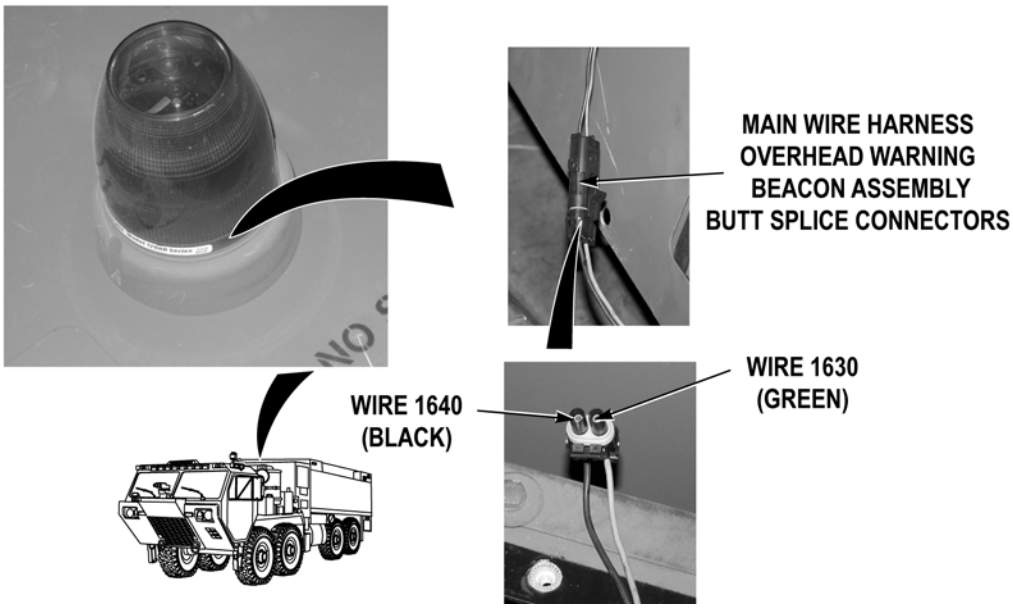
a. If there is no continuity, replace OVERHEAD WARNING switch (WP 0197).



Step 8. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and OVERHEAD WARNING switches to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire 1630 (green) at main 2 connector, terminal C and a known good ground.

If 22 to 28 VDC are not present, repair wire 1630 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



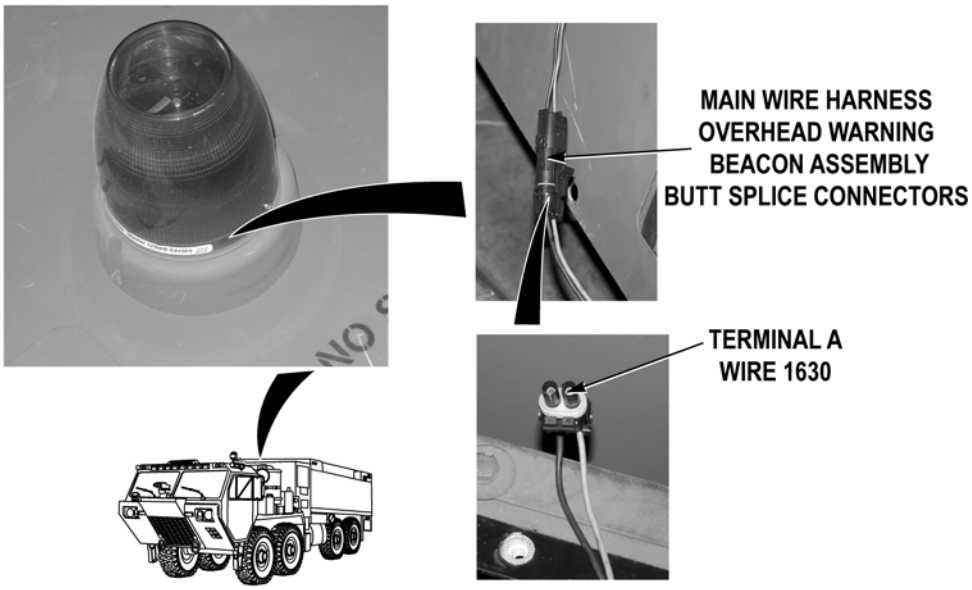
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 9. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Connect main wire harness main 2 connector. Remove pump house panel K (WP 0341). Disconnect main wire harness wire 1630 and wire 1640 overhead warning beacon assembly connector. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and OVERHEAD WARNING switches to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between main wire harness wires 1630 (green) and wire 1640 (black) at main wire harness overhead warning beacon assembly connector.

If 22 to 28 VDC are present, replace overhead warning beacon assembly (WP 0230).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. With a test lead set, check for 22 to 28 VDC between main wire harness wire 1630 (green) at main wire harness overhead warning beacon assembly connector and a known good ground.

a. If 22 to 28 VDC are present, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If 22 to 28 VDC are not present, repair wire 1630 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheels chocked (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WARNING LIGHTS (CAB ROOF LIGHTBAR) DO NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0098
WP 0197
WP 0202
WP 0203
WP 0222

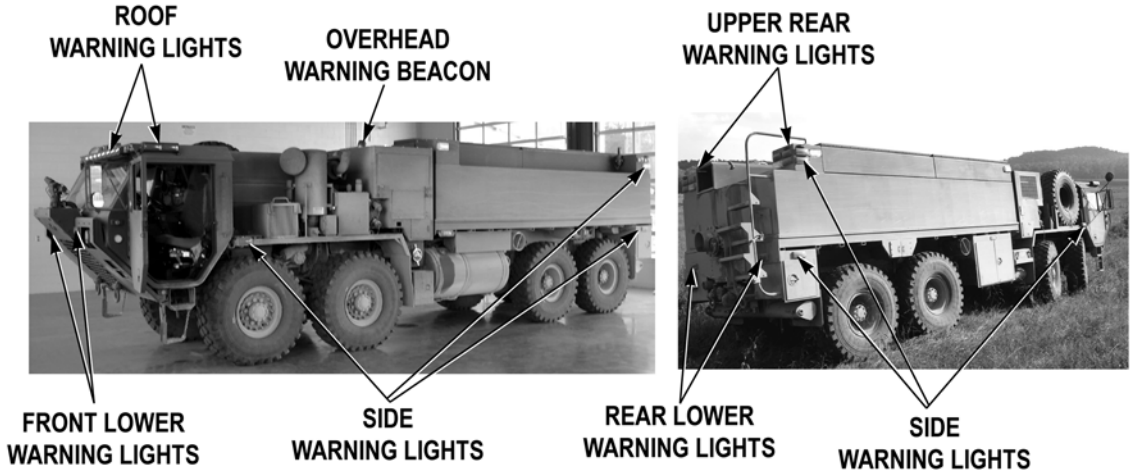
References (continued)
WP 0223
WP 0240
WP 0242
WP 0279
WP 0280
WP 0282
WP 0288
WP 0292

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING LIGHTS (CAB ROOF LIGHTBAR) DO NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and ROOF EMERGENCY LIGHTS switches to on position (WP 0004). Check if at least one cab roof lightbar warning light operates.

If at least one cab roof lightbar warning light operates, go to Step 16.

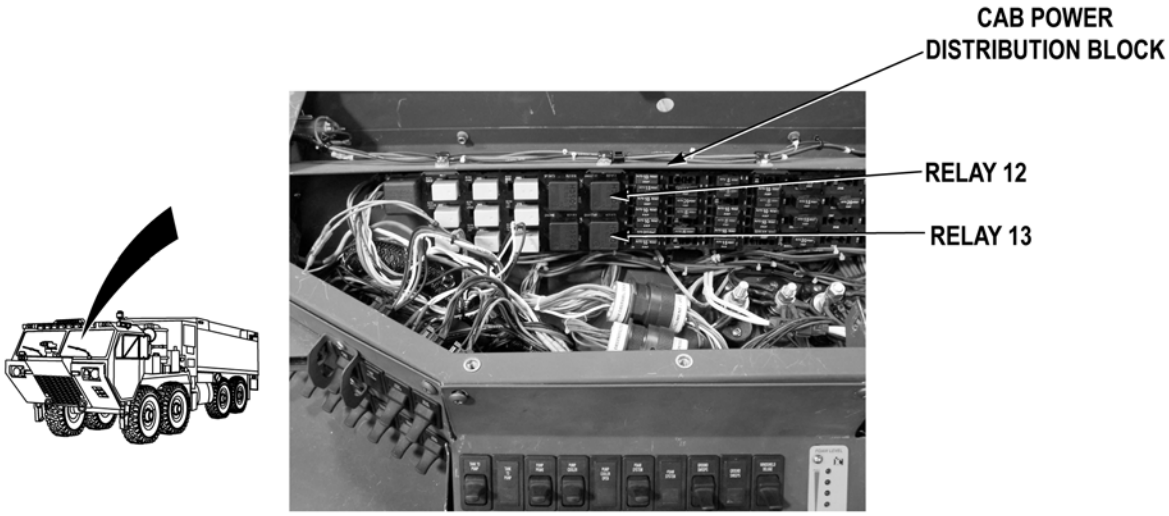
Step 2. Put F/R LOWER WARNING or SIDE WARNING switch to on position (WP 0004). Check if front and rear lower, or side warning lights operate.

If front and rear lower, or side warning lights operate, go to Step 5.

Step 3. Put OVERHEAD WARNING or UPPER REAR WARNING switch to on position (WP 0004). Check if overhead warning beacon or upper rear warning lights operate.

If overhead warning beacon and upper rear warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0098).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

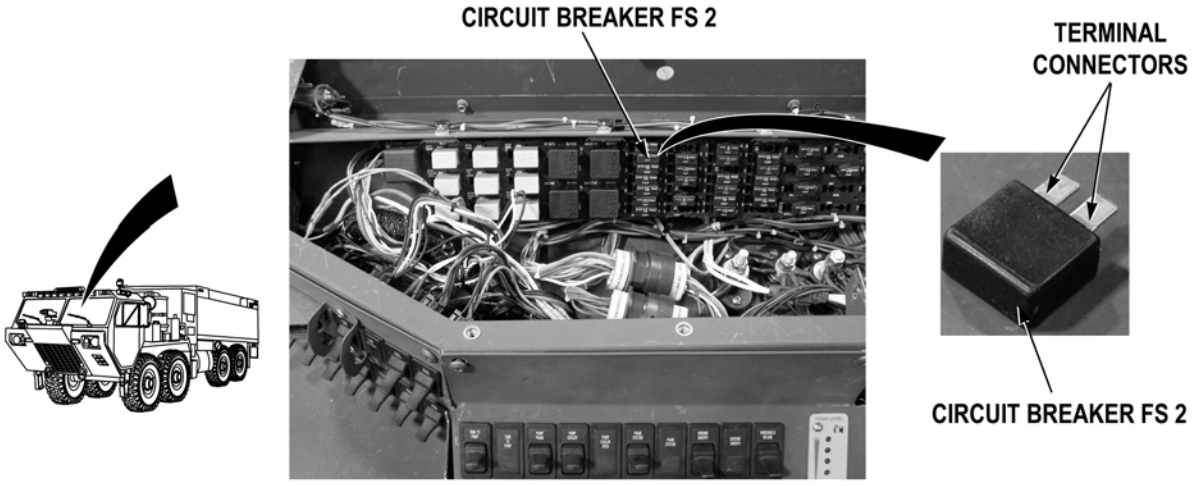
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, SIDE WARNING, UPPER REAR WARNING, and OVERHEAD WARNING switches to off position (WP 0004). Remove cab instrument panel A (WP 0203). Swap relays 12 and 13 (WP 0242). Put EMERG MASTER and ROOF EMERGENCY LIGHTS switches to on position (WP 0004). Check if cab roof lightbar warning lights operate.

a. If cab roof lightbar warning lights operate, return relays to original positions and replace relay 12 (WP 0242).

b. If cab roof lightbar warning lights do not operate, replace cab power distribution wire harness and block (WP 0280).

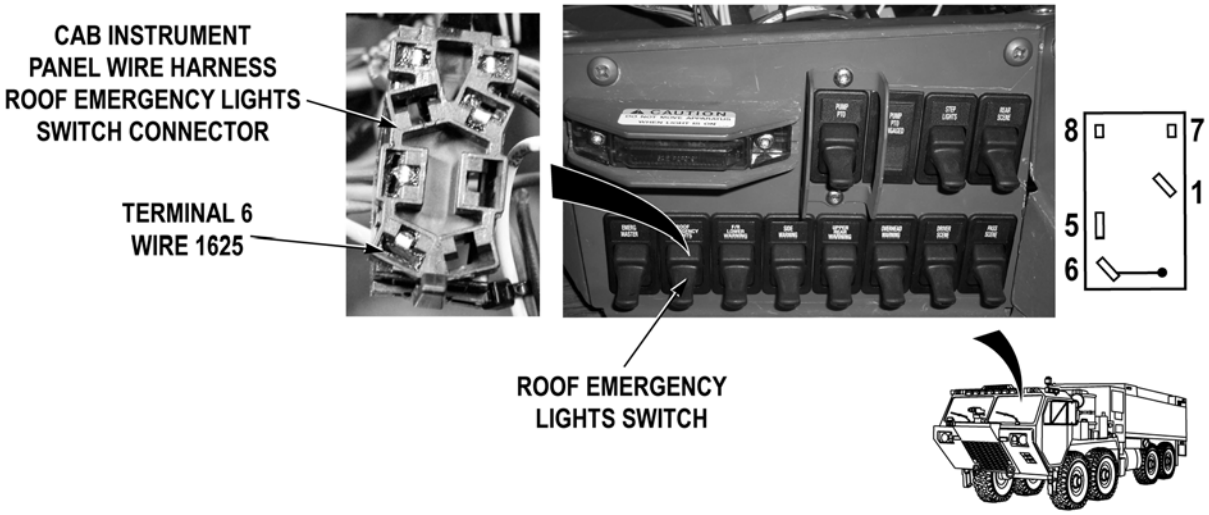
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 2 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 2 (WP 0240).

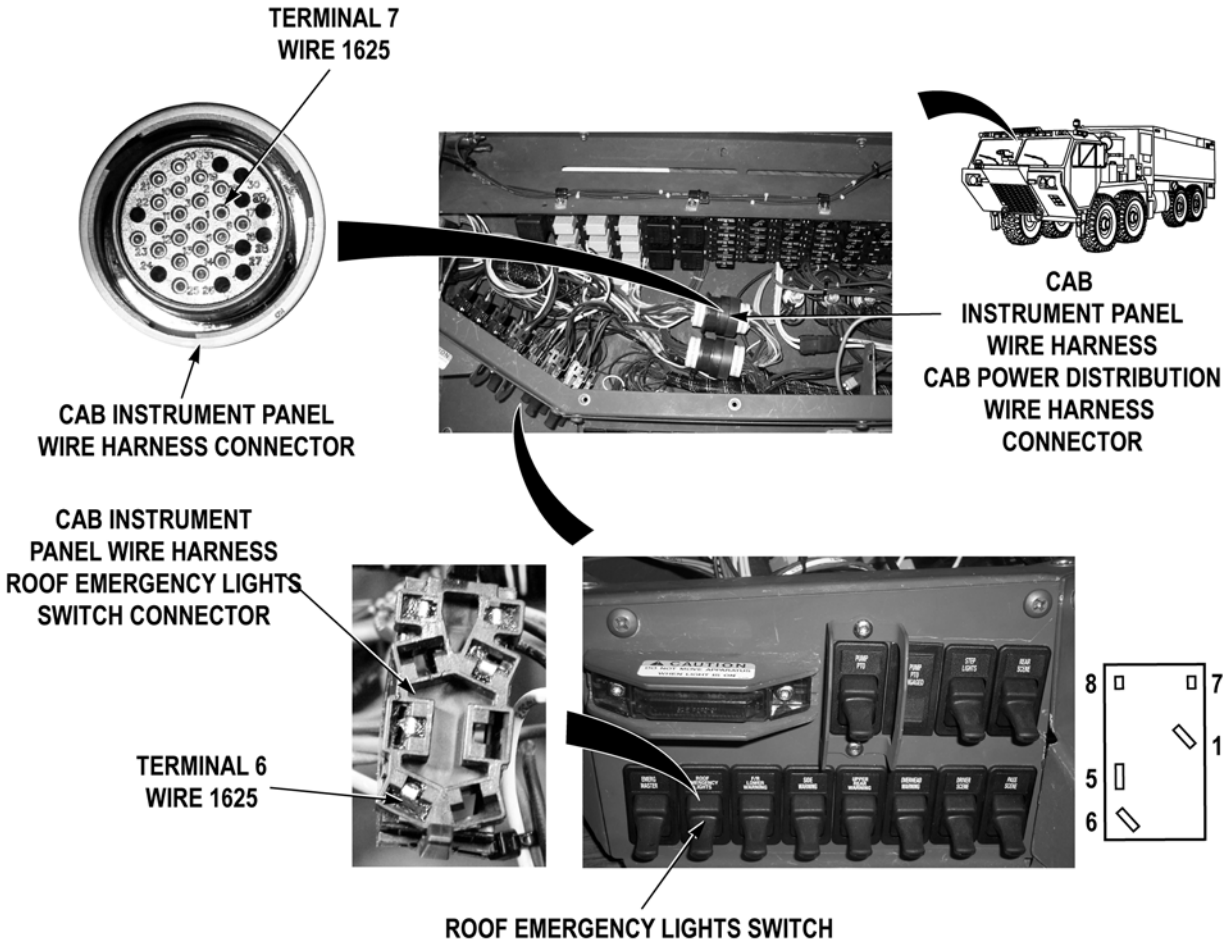
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Install circuit breaker FS 2 (WP 0240). Remove cab instrument panel C (WP 0203). Push battery disconnect switch to on position (WP 0007). Disconnect cab instrument panel wire harness ROOF EMERGENCY LIGHTS switch connector. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position. (WP 0004). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1625 (white) at ROOF EMERGENCY LIGHTS switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

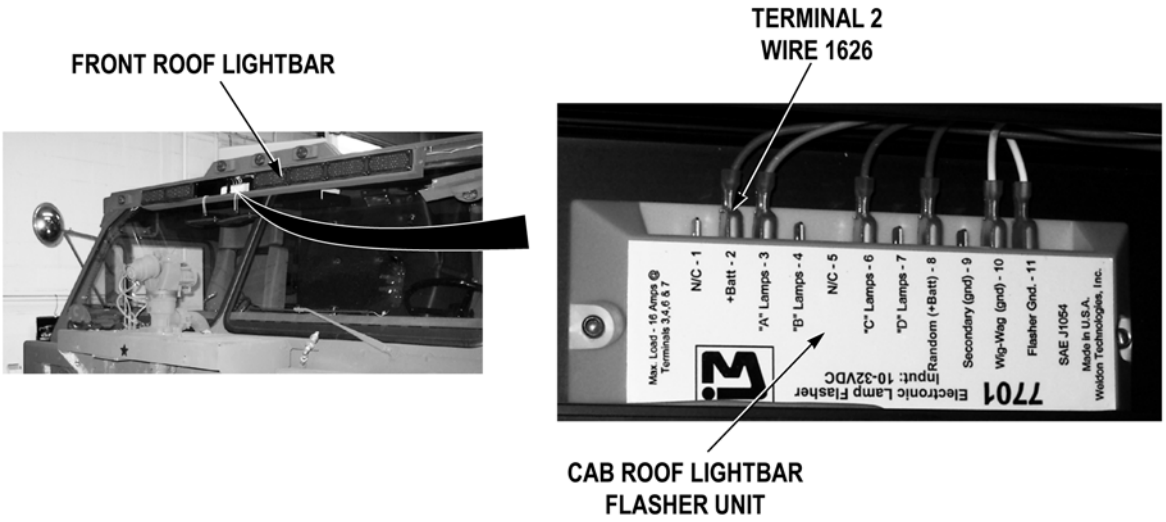


Step 7. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1625 (white) from cab instrument panel wire harness connector, terminal 7 to ROOF EMERGENCY LIGHTS switch connector, terminal 6.

a. If there is continuity, repair wire 1625 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1625 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



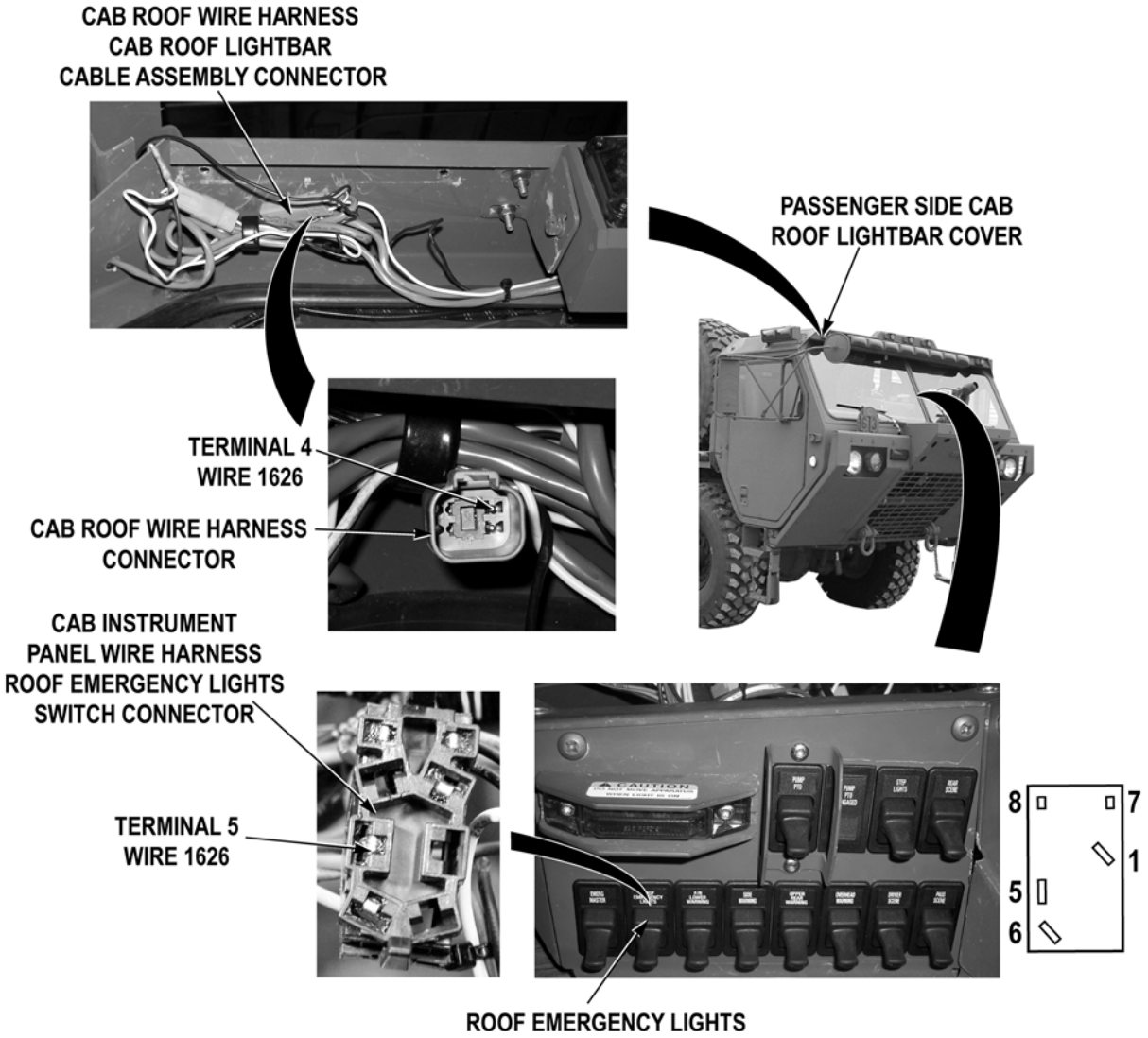
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Remove third and fourth warning lights on passenger side of front cab roof lightbar (WP 0222). Check for 22 to 28 VDC between cab roof lightbar cable assembly wire 1626 (red) at cab roof lightbar flasher unit, terminal 2 and a known good ground.

If 22 to 28 VDC are present, go to Step 13.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



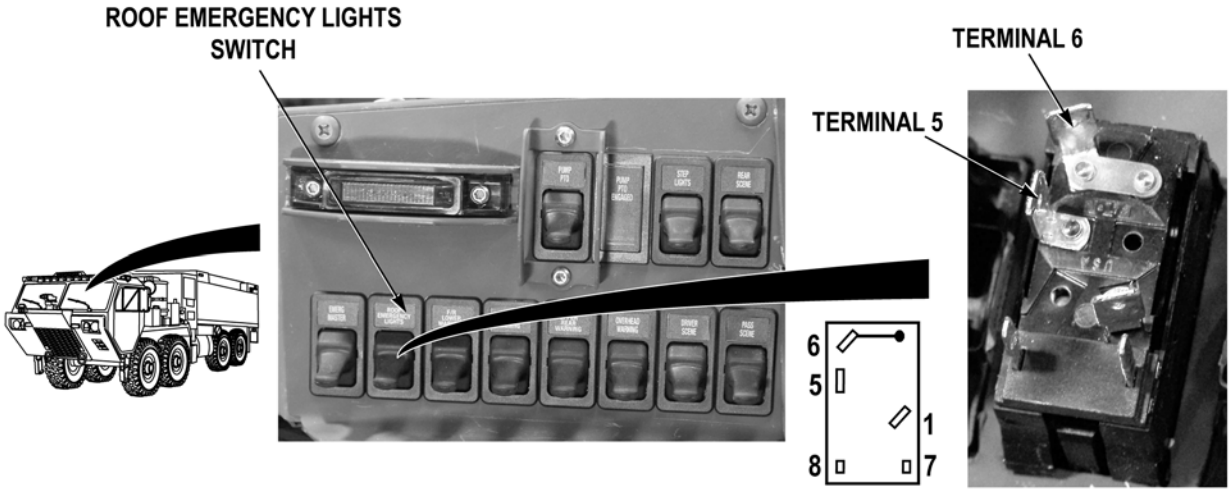
Step 9. Remove passenger side cab roof lightbar cover (WP 0222). Disconnect cab roof wire harness cab roof lightbar cable assembly connector. With a test lead set, check for 22 to 28 VDC between cab roof wire harness wire 1626 (white) at cab roof wire harness cab roof lightbar cable assembly connector, terminal 4 and a known good ground.

If 22 to 28 VDC are present, repair wire 1626 in lightbar cable assembly if repairable (TM 9-2320-315-14&P), or replace lightbar cable assembly (WP 0292).

Step 10. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 1626 (white) from cab instrument panel wire harness ROOF EMERGENCY LIGHTS switch connector, terminal 5, to cab roof wire harness connector, terminal 4.

If there is no continuity, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

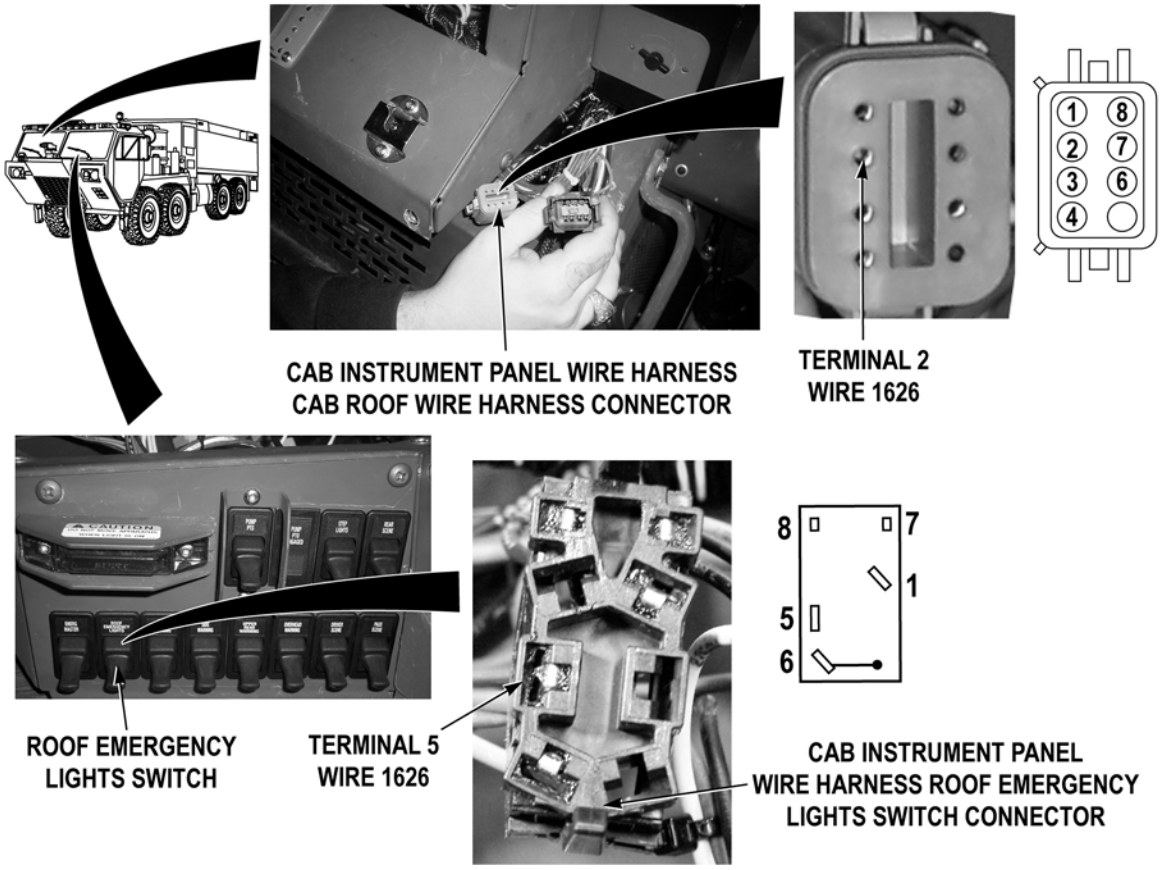


Step 11. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across ROOF EMERGENCY LIGHTS switch, from terminal 5 to terminal 6, when switch is in on position.

a. If there is no continuity, replace ROOF EMERGENCY LIGHTS switch (WP 0197).

b. If there is continuity, go to Step 13.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

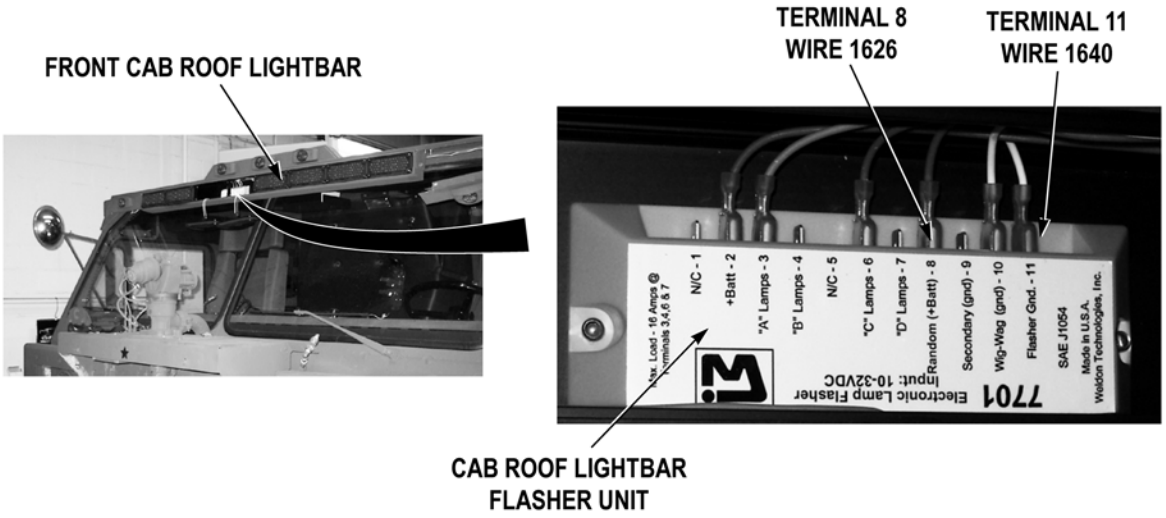


Step 12. Remove cab instrument panel assembly (WP 0202). Disconnect cab instrument panel wire harness cab roof wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1626 (white) at cab instrument panel wire harness cab roof wire harness connector, terminal 2 to cab instrument panel wire harness ROOF EMERGENCY LIGHT switch connector, terminal 5.

a. If there is continuity, repair wire 1626 in cab roof wire harness if repairable (TM 9-2320-315-14&P), or replace cab roof wire harness (WP 0282).

b. If there is no continuity, repair wire 1626 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



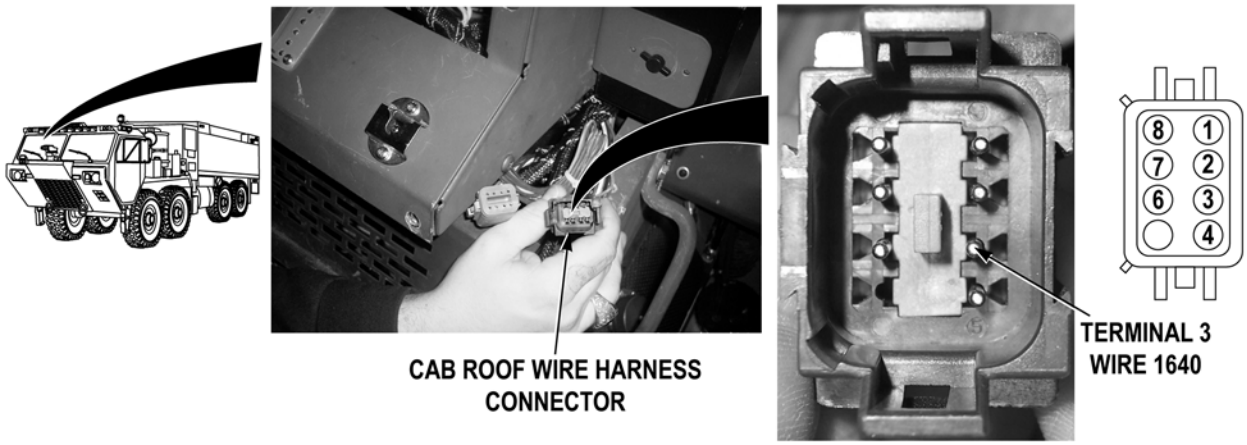
Step 13. Check for 22 to 28 VDC between cab roof lightbar cable assembly wire 1626 (red) at cab roof lightbar flasher unit, terminal 8 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1626 in cab roof lightbar cable assembly if repairable (TM 9-2320-315-14&P), or replace cab roof lightbar cable assembly (WP 0292).

Step 14. Put EMERG MASTER and ROOF EMERGENCY LIGHTS switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across ground wire (white) from cab roof lightbar flasher unit, terminal 11 to a known good ground.

If there is continuity, replace cab roof lightbar flasher unit (WP 0288).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Remove cab instrument panel assembly (WP 0202). Disconnect cab instrument panel wire harness cab roof wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1640 (black) from cab instrument panel wire harness connector, terminal 3 to a known good ground.

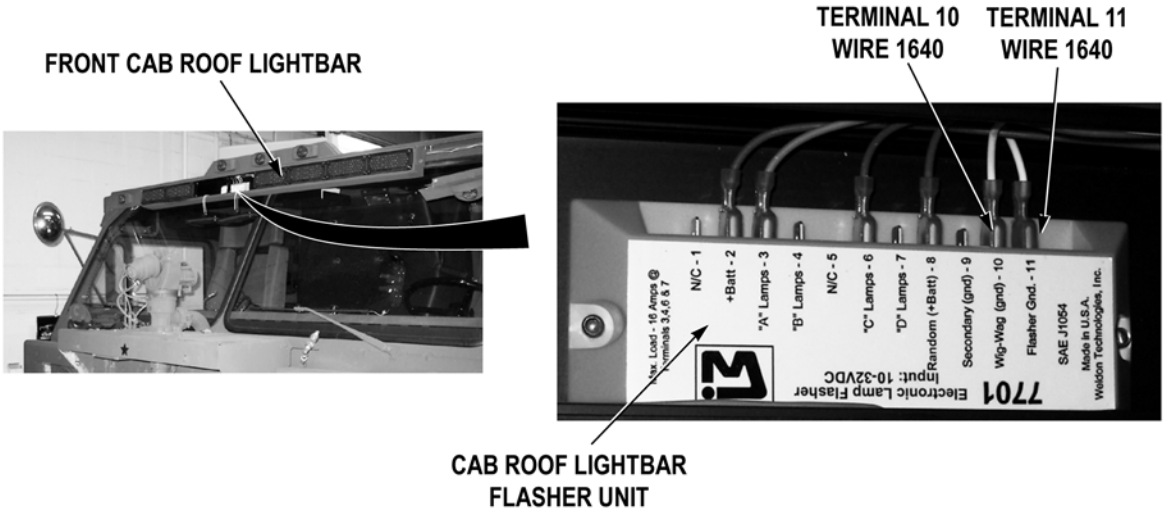
a. If there is continuity, repair wire 1640 in cab roof wire harness if repairable (TM 9-2320-315-14&P), or replace cab roof wire harness (WP 0282).

b. If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 16. Check if cab roof lightbar warning lights flash in an alternating flash pattern, six lights at a time.

If cab roof lightbar warning lights flash in an alternating flash pattern, go to Step 18.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Put EMERG MASTER and ROOF EMERGENCY LIGHTS switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove third and fourth warning lights on passenger side of cab roof lightbar (WP 0222). Check for continuity across cab roof lightbar cable assembly from cab roof lightbar flasher unit, terminals 10 and 11.

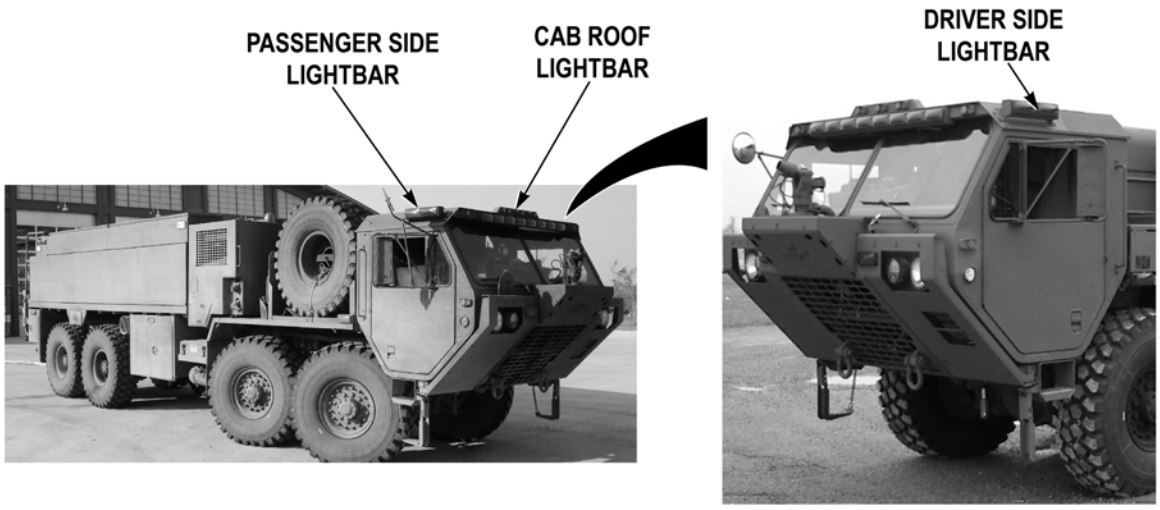
a. If there is continuity, replace roof lightbar flasher unit (WP 0288).

b. If there is no continuity, repair wire 1640 if repairable (TM 9-2320-315-14&P), between roof lightbar flasher unit, terminals 10 and 11 or replace lightbar cable assembly (WP 0292).

Step 18. Check if there is more than one non-operating cab roof lightbar warning light.

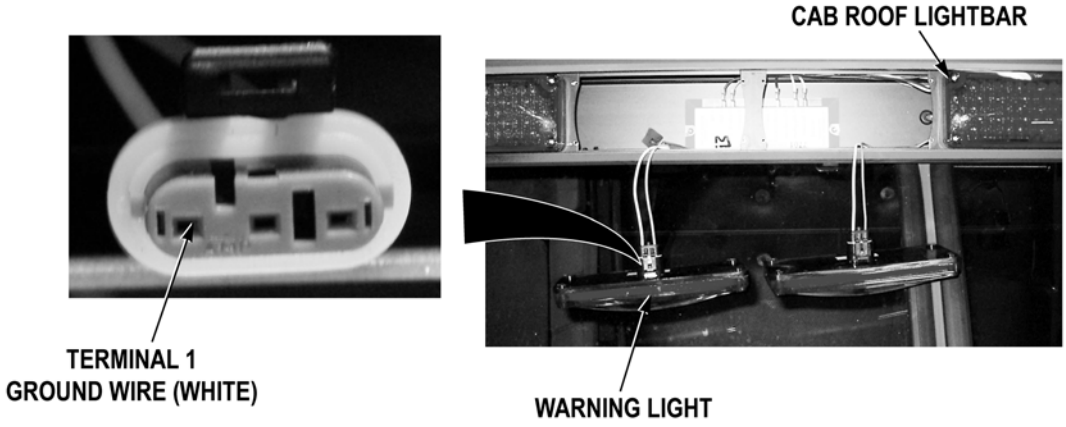
If there is more than one non-operating cab roof lightbar warning light, go to Step 24.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Check if non-operating warning light is located on front cab roof lightbar.

If non-operating warning light is located on passenger side or driver side lightbar, go to Step 27.



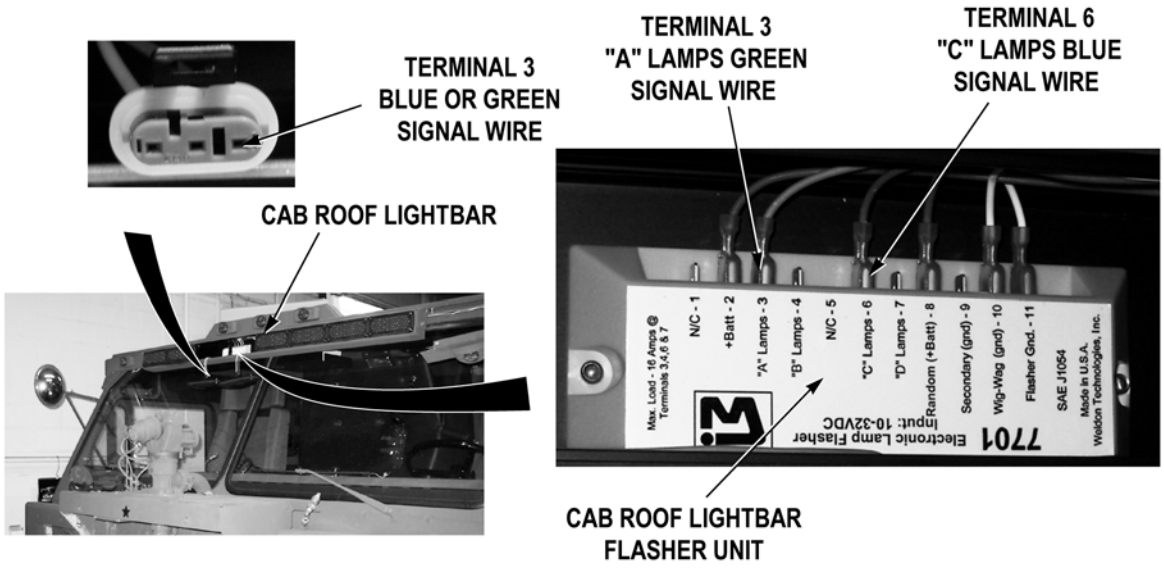
Step 20. Put EMERG MASTER and ROOF EMERGENCY LIGHTS switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove non-operating warning light from cab roof lightbar (WP 0222). With a test lead set, check for continuity across cab roof lightbar cable assembly ground wire (white) from non-operating cab roof warning light connector, terminal 1, to a known good ground.

If there is no continuity, repair ground wire in cab roof lightbar cable assembly if repairable (TM 9-2320-315-14&P), or replace cab roof lightbar cable assembly (WP 0292).

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



NOTE

Cab roof lightbar flasher unit has four outputs at terminals 3, 4, 6, and 7. Cab roof lightbar flasher unit output terminals 3 and 6 are connected to six warning lights each.

Step 21. Remove non-operating warning light from cab roof lightbar (WP 0222). Check wire colors that are connected to warning light.

If wire colors are white and green go to Step 23.

Step 22. If installed, remove third and fourth warning lights on passenger side of cab roof lightbar (WP 0222). Disconnect lightbar cable assembly from non-operating warning light. Check for continuity across lightbar cable assembly blue signal wire from non-operating warning light connector to cab roof lightbar flasher unit, terminal 6 “C” lamps connector.

a. If there is continuity, replace non-operating warning light (WP 0222).

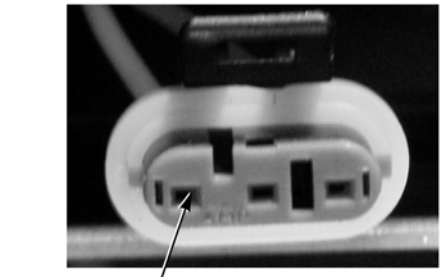
b. If there is no continuity, repair blue signal wire in lightbar cable assembly if repairable (TM 9-2320-315-14&P), or replace lightbar cable assembly (WP 0292).

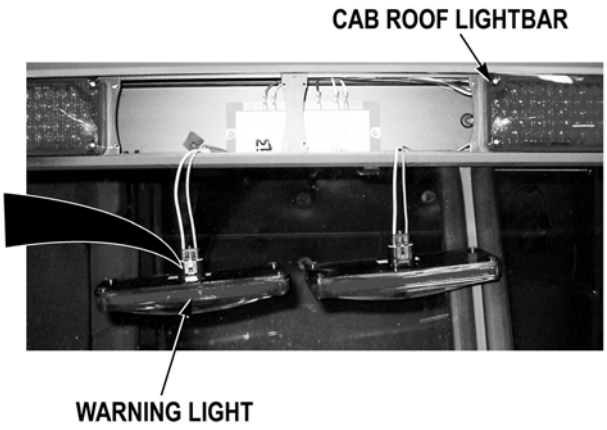
Step 23. If installed, remove third and fourth warning lights on passenger side of cab roof lightbar (WP 0222). Disconnect lightbar cable assembly from non-operating warning light. Check for continuity across lightbar cable assembly green signal wire from non-operating warning light connector to cab roof lightbar flasher unit, terminal 3 “A” lamps connector.

a. If there is continuity, replace non-operating warning light (WP 0222).

b. If there is no continuity, repair green signal wire in lightbar cable assembly if repairable (TM 9-2320-315-14&P), or replace lightbar cable assembly (WP 0292).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





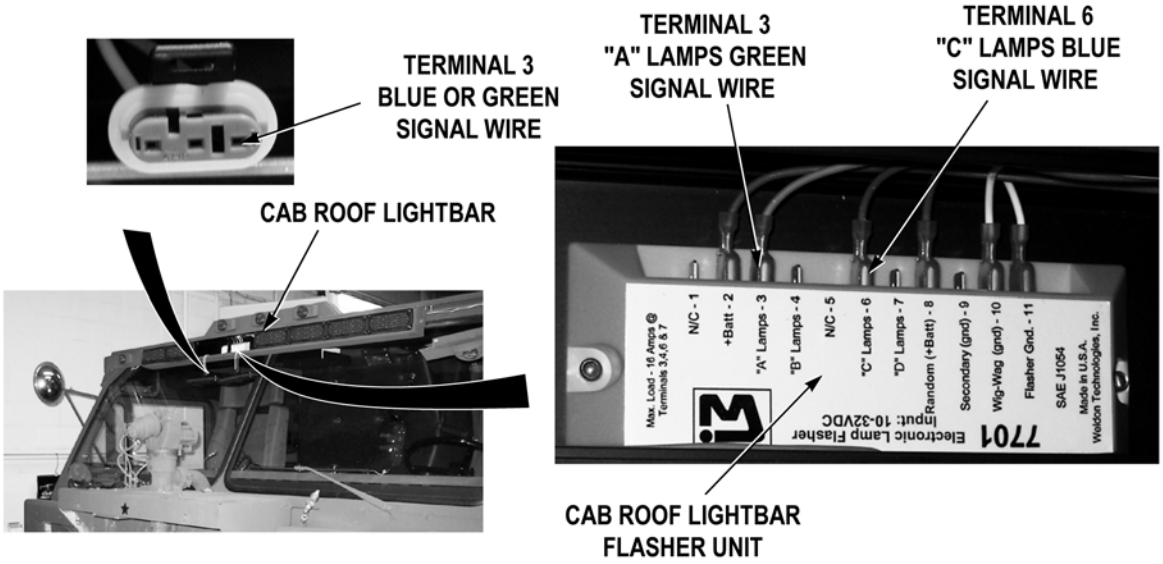
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 24. Put EMERG MASTER and ROOF EMERGENCY LIGHTS switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove non-operating warning light from passenger side or driver side cab roof lightbar (WP 0223). With a test lead set, check for continuity across ground wire (white) from non-operating cab roof lightbar warning light connector terminal 1 to a known good ground.

If there is no continuity, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



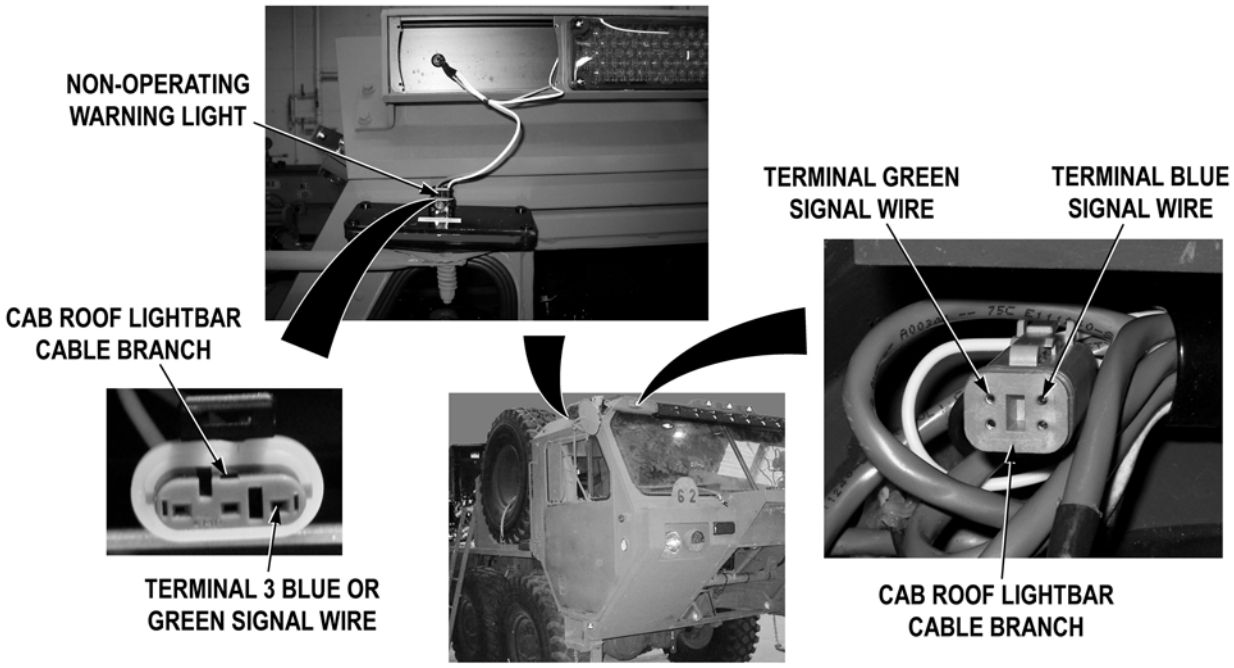
NOTE

Cab roof lightbar flasher unit has four outputs at terminals 3, 4, 6, and 7. Cab roof lightbar flasher unit output terminals 3 and 6 are connected to six warning lights each.

Step 25. Remove third and fourth warning lights on passenger side of front cab roof lightbar (WP 0222). With a test lead set, check for continuity across blue or green signal wire from non-operating warning light connector to cab roof lightbar flasher unit, terminals 3 or 6.

If there is continuity between non-operating warning light connector and cab roof lightbar flasher unit, terminals 3 or 6 replace non-operating warning light (WP 0223).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

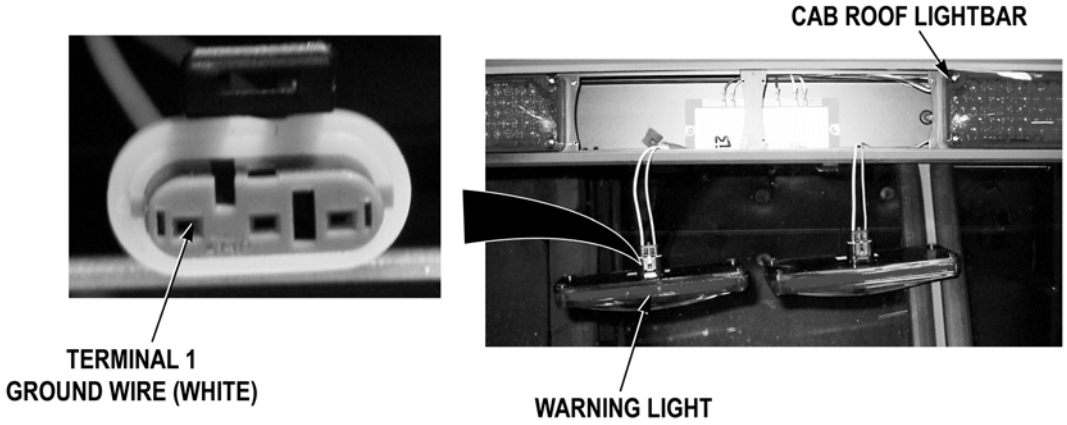


Step 26. Remove cab roof lightbar cover for associated driver side or passenger side cab roof lightbar (WP 0223). Disconnect driver side or passenger side cab roof lightbar cable assembly branch connector from non-operating warning light. With a test lead set, check for continuity across blue and green signal wire at non-operating warning light lightbar cable assembly branch, terminal 3 to side cab roof lightbar cable assembly branch connector, terminal.

a. If there is continuity, repair green or blue signal wire in lightbar cable assembly if repairable TM 9-2320-315-14&P), or replace lightbar cable assembly (WP 0292).

b. If there is no continuity, repair green or blue signal wires in lightbar cable assembly if repairable (TM 9-2320-315-14&P), or replace lightbar cable assembly branch (WP 0291).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



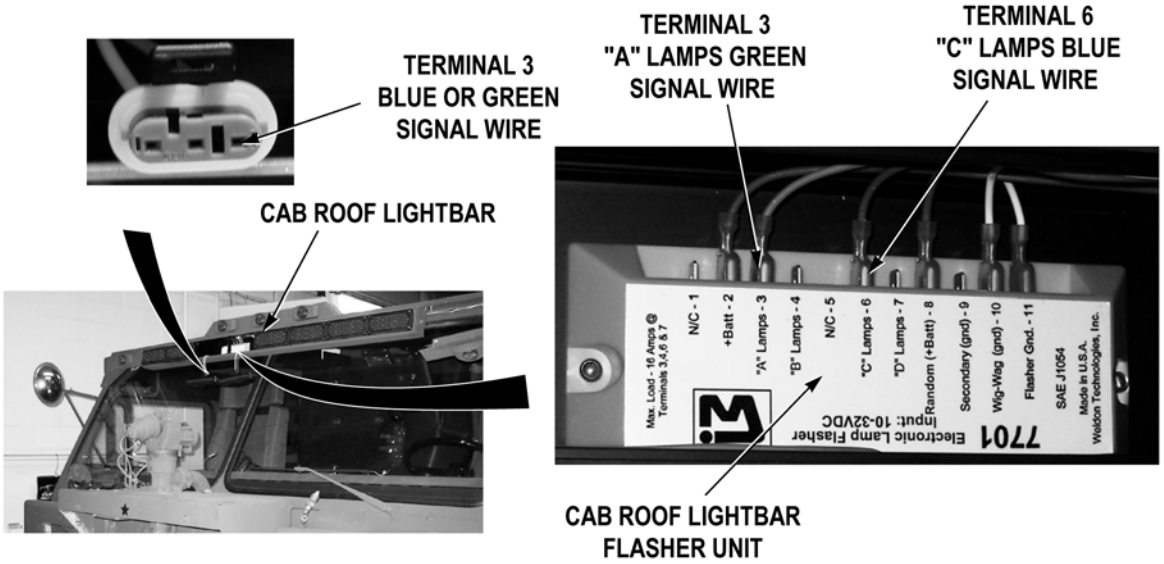
Step 27. Put EMERG MASTER and ROOF EMERGENCY LIGHTS switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove one non-operating warning lights from front cab roof lightbar (WP 0222). With a test lead set, check for continuity across lightbar cable assembly ground wire (white) from non-operating warning light connector to a known good ground.

If there is no continuity, repair lightbar cable assembly ground wire (white) if repairable (TM 9-2320-315-14&P), or replace lightbar cable assembly (WP 0292).

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



NOTE

Cab roof lightbar flasher unit has four outputs at terminals 3, 4, 6, and 7. Cab roof lightbar flasher unit output terminals 3 and 6 are connected to six warning lights each.

Step 28. If installed, remove third and fourth warning light on passenger side of front cab roof lightbar (WP 0222). With a test lead set, check for continuity across blue or green signal wire from selected non-operating warning light connector to cab roof lightbar flasher unit, terminals 3 or 6.

a. If there is continuity between non-operating lightbar connector and cab roof lightbar flasher unit, terminals 3 or 6, replace front cab roof lightbar flasher unit (WP 0288).

b. If there is no continuity, repair blue or green signal wire in lightbar cable assembly if repairable (TM 9-2320-315-14&P), or replace lightbar cable assembly (WP 0292).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WARNING LIGHTS (SIDE) DO NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0100
WP 0194
WP 0197
WP 0203
WP 0229
WP 0240

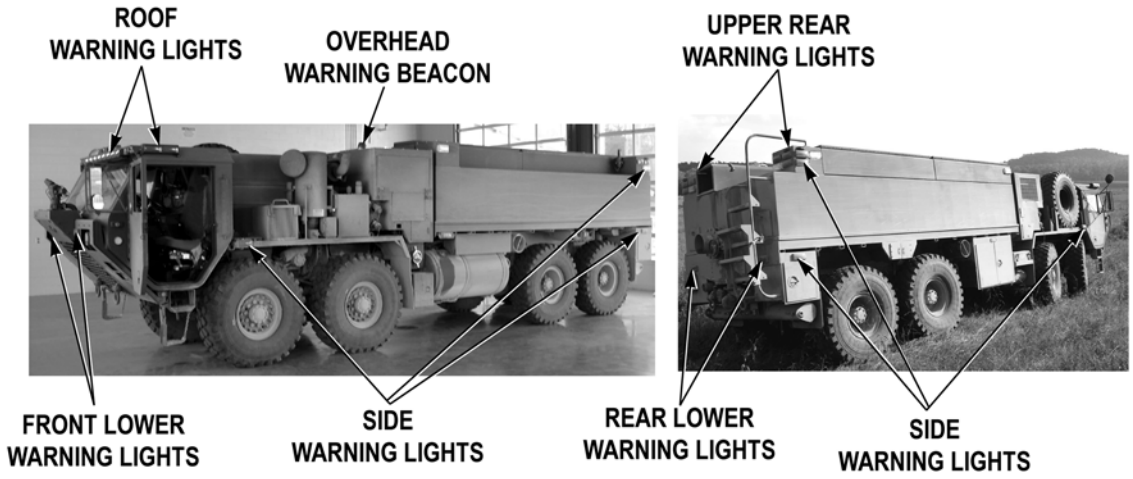
References (continued)
WP 0242
WP 0279
WP 0280
WP 0287
WP 0293
WP 0299
WP 0337

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING LIGHTS (SIDE) DO NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and SIDE WARNING switches to on position (WP 0004). Check if at least one side warning light operates.

If at least one side warning light (upper or lower) operates, go to Step 12.

Step 2. Put ROOF EMERGENCY LIGHTS or F/R LOWER WARNING switch to on position (WP 0004). Check if roof, front, or rear lower warning lights operate.

If roof, front, or rear lower warning lights operate, go to Step 5.

Step 3. Put OVERHEAD WARNING or UPPER REAR WARNING switch to on position (WP 0004). Check if overhead warning beacon or upper rear warning lights operate.

If overhead warning beacon and upper rear warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0100).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

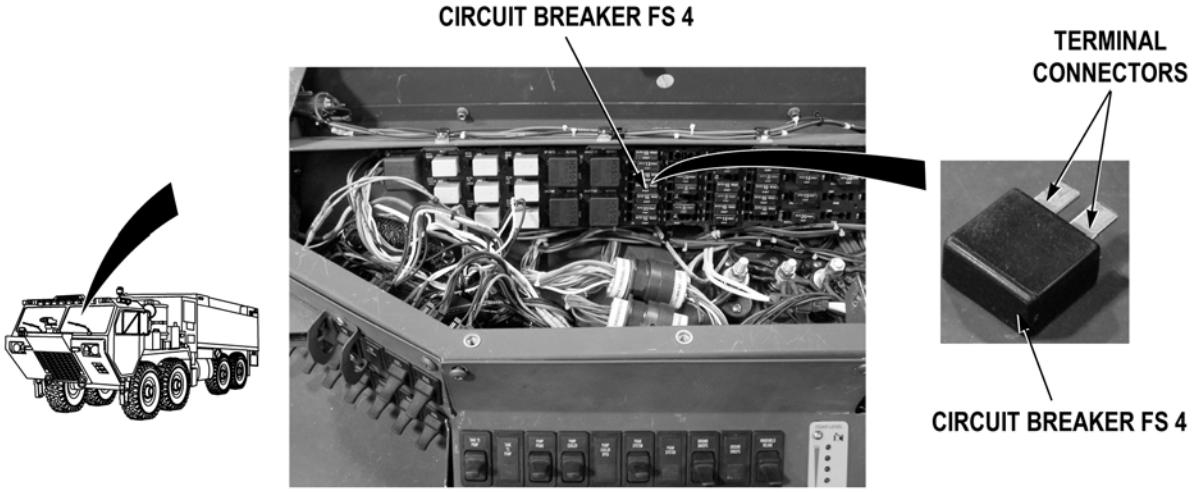
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, SIDE WARNING, UPPER REAR WARNING and OVERHEAD WARNING switches to off position (WP 0004). Remove cab instrument panel A (WP 0203). Swap relays 12 and 13 (WP 0242). Put EMERG MASTER and SIDE WARNING switches to on position (WP 0004). Check if side warning lights operate.

a. If side warning lights operate, return relays to original positions and replace relay 12 (WP 0242).

b. If side warning lights do not operate, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 4 (WP 0240). Check for continuity across circuit breaker.

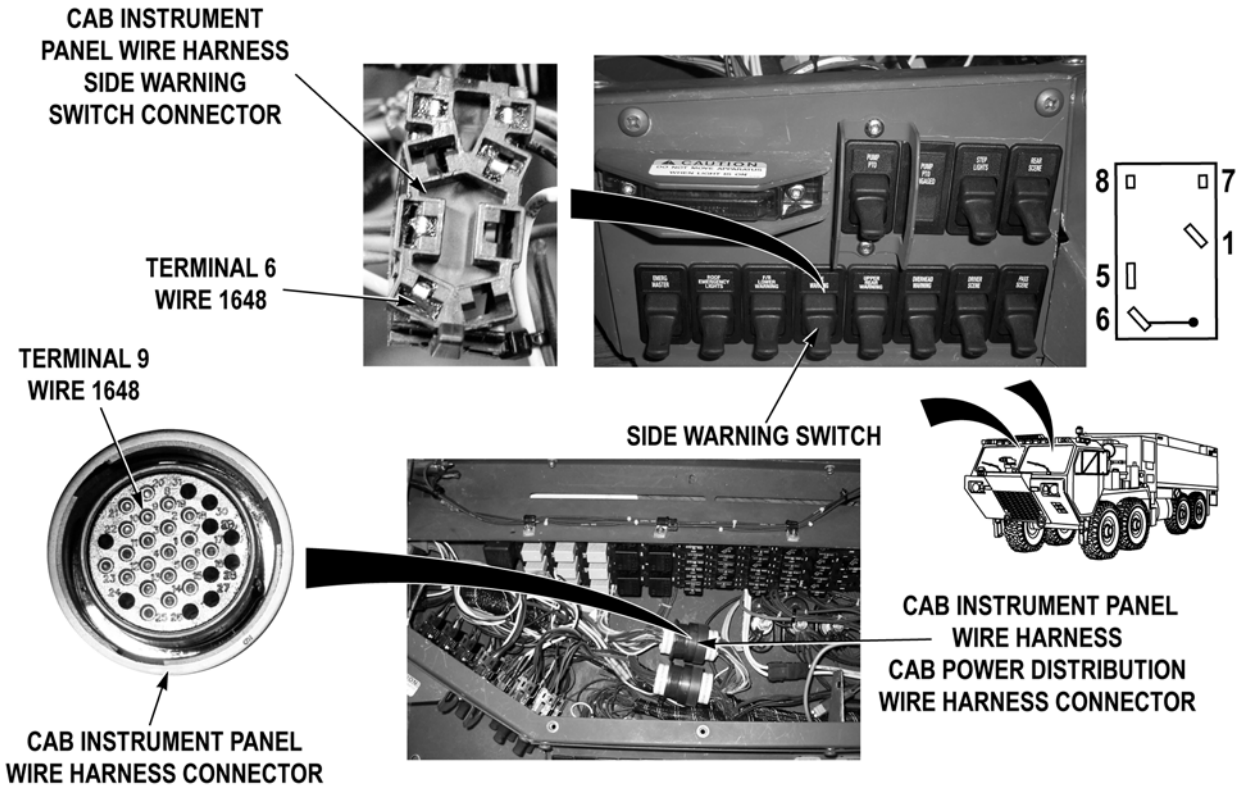
If there is no continuity, replace circuit breaker FS 4 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 6. Install circuit breaker FS 4 (WP 0240). Remove cab instrument panel C (WP 0203). Push battery disconnect switch to on position (WP 0007). Disconnect cab instrument panel wire harness SIDE WARNING switch connector. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire 1648 (yellow) at SIDE WARNING switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

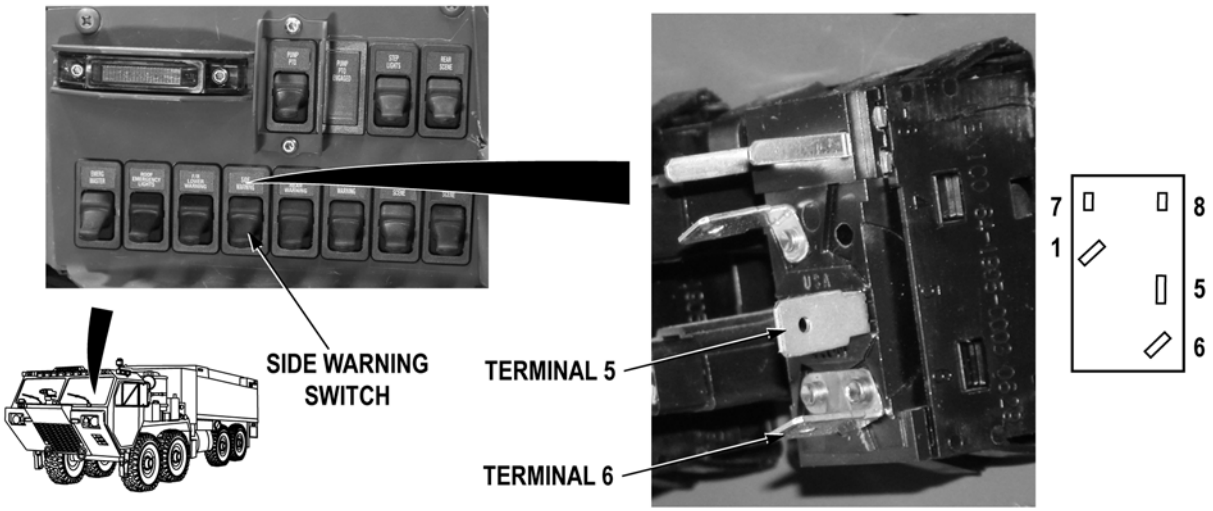


Step 7. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1648 (yellow) from cab instrument panel wire harness connector, terminal 9 to SIDE WARNING switch connector, terminal 6.

a. If there is continuity, repair wire 1648 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1648 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

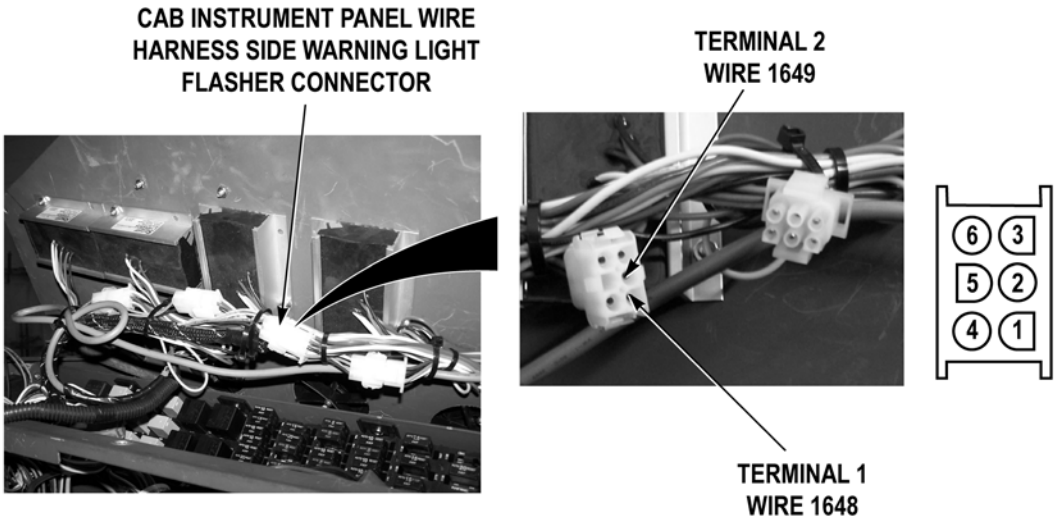
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across SIDE WARNING switch, from terminal 5 to terminal 6, when switch is in on position.

If there is no continuity, replace SIDE WARNING switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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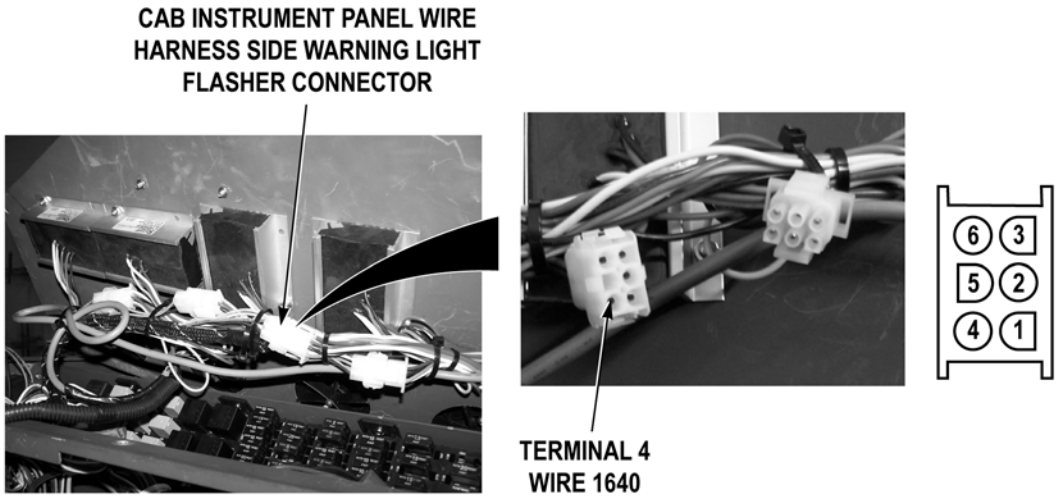
Step 9. Disconnect cab instrument panel wire harness side warning light flasher unit connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position (WP 0004). With a lead test set, check for 22 to 28 VDC between cab instrument panel wire harness wire 1648 (yellow) at side warning light flasher unit connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1648 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 10. Put SIDE WARNING switch to on position (WP 0004). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1649 (yellow) at side warning light flasher unit connector, terminal 2 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1649 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 1640 (black) from cab instrument panel wire harness side warning light flasher unit connector, terminal 4 to a known good ground.

a. If there is continuity, replace side warning light flasher unit (WP 0194).

b. If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

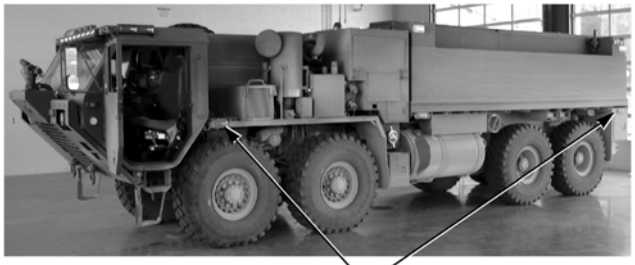
Step 12. Check if lower side warning lights operate.

If all lower side warning lights operate, go to Step 19.

Step 13. Check if at least one lower side warning light operates.

If all lower side warning lights do not operate, go to Step 16.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



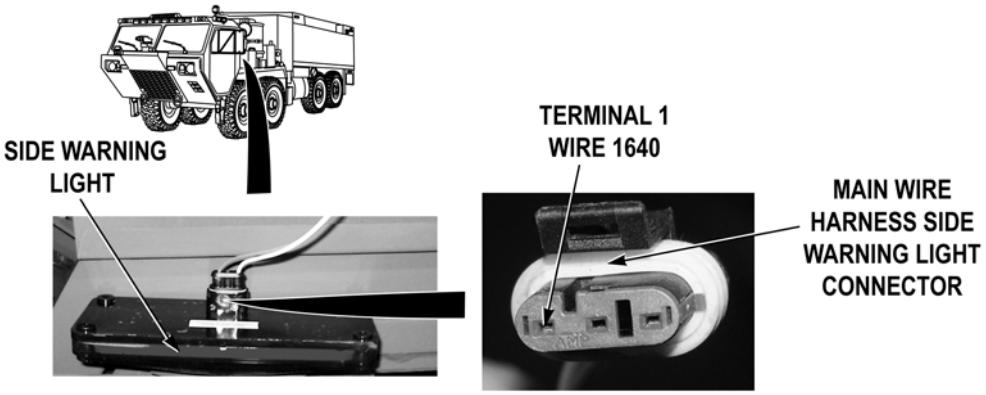
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Remove an operating side warning light (WP 0229). Remove non-operating side warning light and replace with operating warning light (WP 0229). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and SIDE WARNING switches to on position (WP 0229). Check if operating warning light operates in non-operating position.

If operating warning light operates in non-operating position, replace non-operating warning light (WP 0229).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove non-operating side warning light (WP 0229). With a test lead set, check for continuity across main wire harness wire 1640 (black) from side warning light connector, terminal 1 to a known good ground.

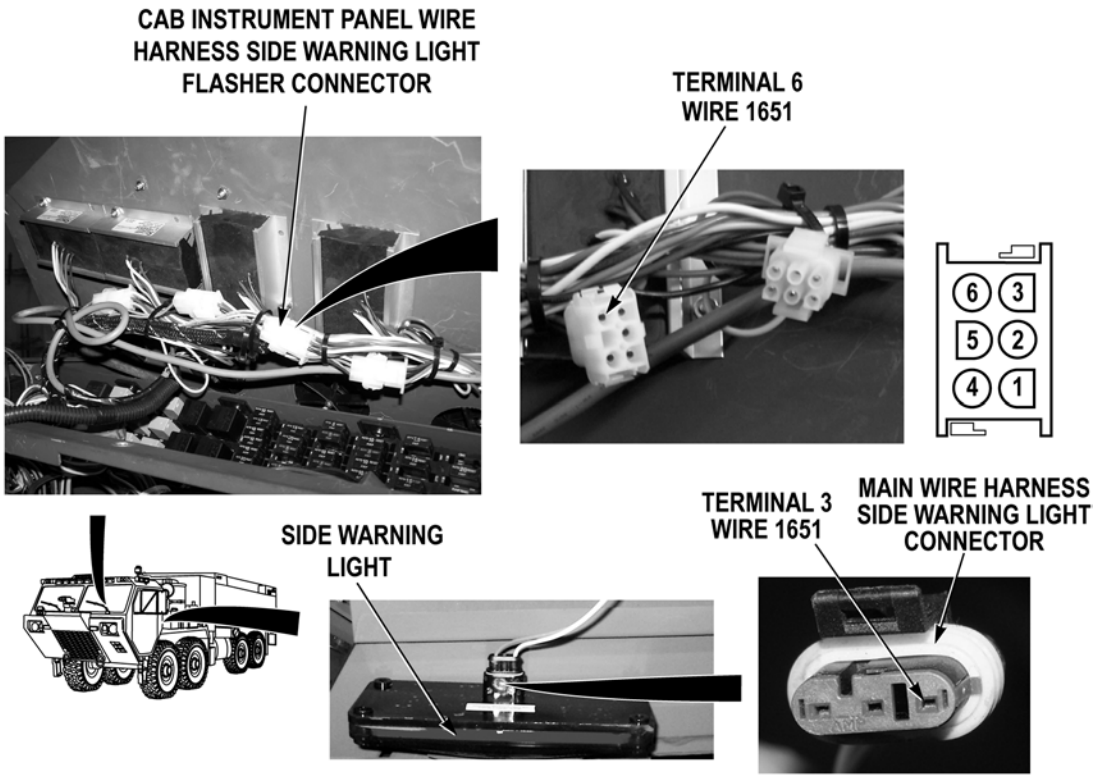
a. If there is continuity, repair wire 1651 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 16. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove one of the side warning lights (WP 0229). With a test lead set, check for continuity across main wire harness wire 1640 (black) from side warning light connector, terminal 1 to a known good ground.

If there is no continuity, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Remove cab instrument panel A (WP 0203). Disconnect cab instrument panel wire harness side warning light flasher unit connector. With a test lead set, check for continuity across wire 1651 (brown) from main wire harness side warning light connector, terminal 3 to cab instrument panel wire harness side warning light flasher unit connector, terminal 6.

If there is continuity, replace side warning light flasher unit (WP 0194).

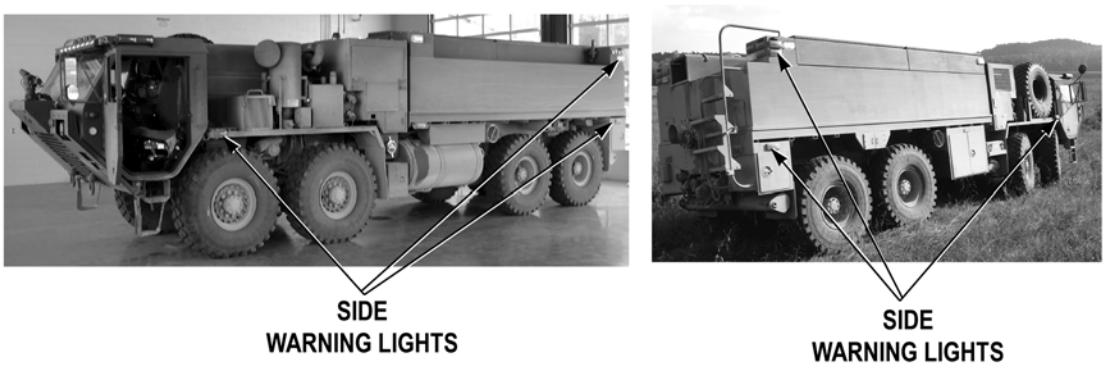
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 18. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 1651 (brown) from side warning light connector, terminal 3 to main wire harness main 2 connector, terminal N.

a. If there is continuity, repair wire 1651 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1651 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Check if at least one upper side warning light operates.

If all upper side warning lights do not operate, go to Step 33.

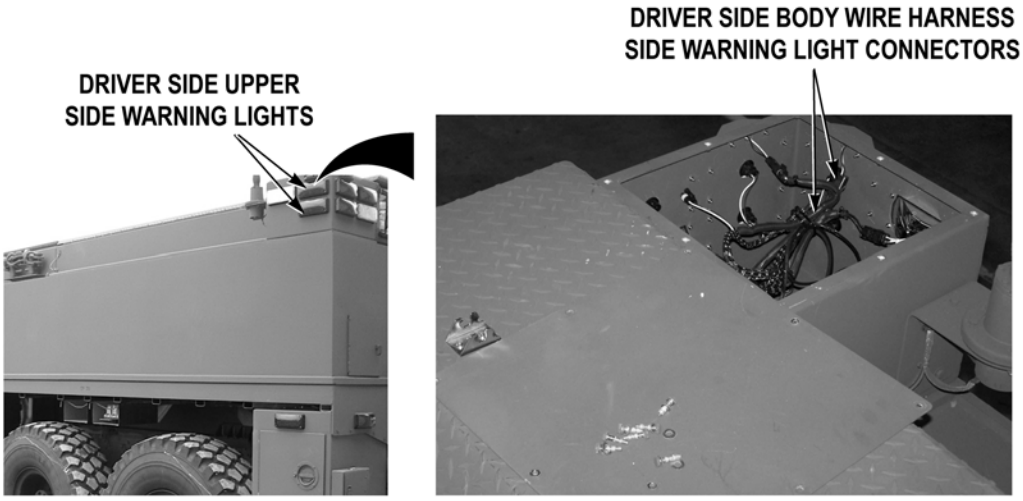
Step 20. Check if both driver side upper side warning light operates.

If both driver side upper side warning lights operate, go to Step 27.

Step 21. Check if at least one driver side upper side warning light operates.

If both driver side upper side warning lights do not operate, go to Step 24.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



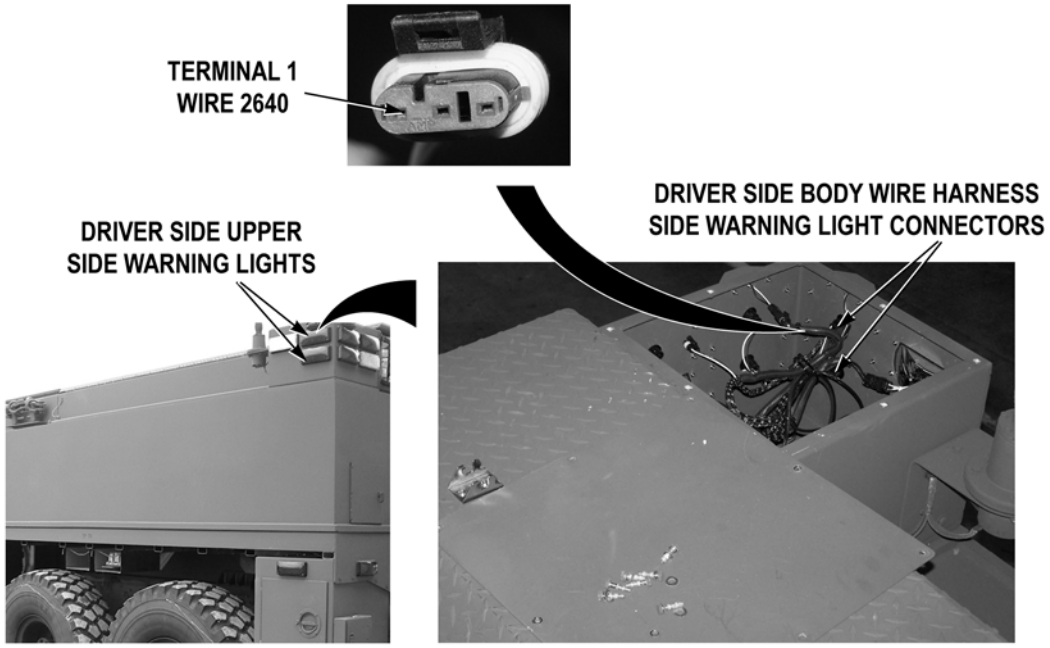
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 22. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0007). Turn Service Drive Lights Off (TM 9-2320-279-10). Remove driver side rear light bezel cover (WP 0337). Disconnect driver side body wire harness side warning light connector from operating side warning light (WP 0229). Disconnect driver side body wire harness side warning light connector from non-operating upper side warning light (WP 0229). Connect driver side body wire harness side warning light connector that was disconnected from operating warning light to non-operating side warning light. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and SIDE WARNING switches to on position (WP 0004). Check if non-operating warning light operates.

If non-operating warning light does not operate while connected to operating warning light connector, replace non-operating warning light (WP 0229).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

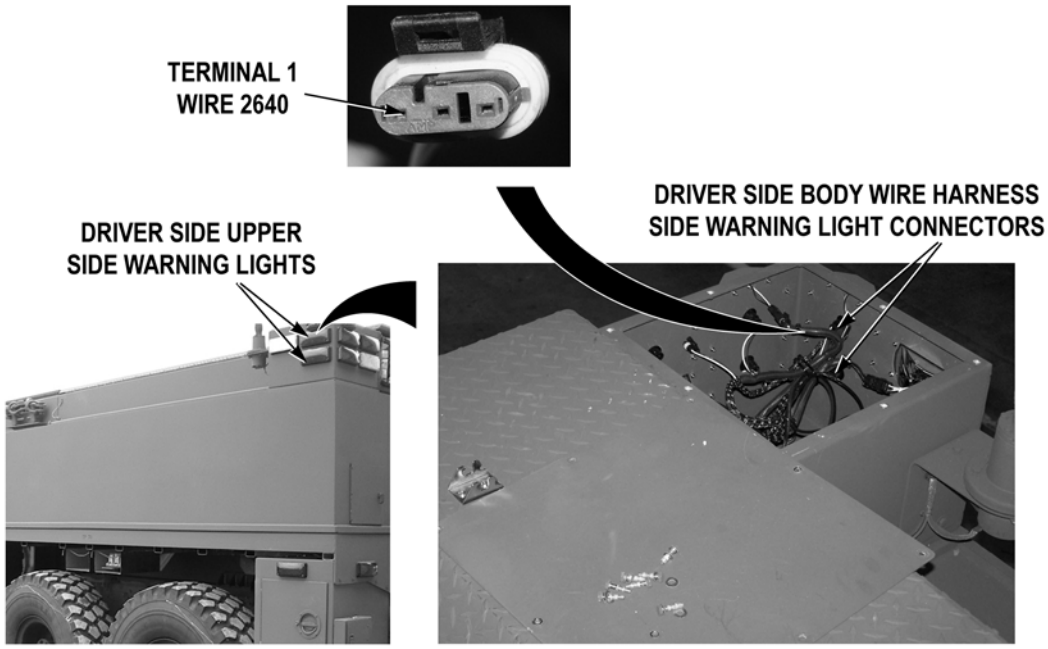


Step 23. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect driver side body wire harness side warning light connector from non-operating upper side warning light (WP 0229). With a test lead set, check for continuity across driver side body wire harness wire 2640 (black) from warning light connector, terminal 1 to a known good ground.

a. If there is continuity, repair wire 1650 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



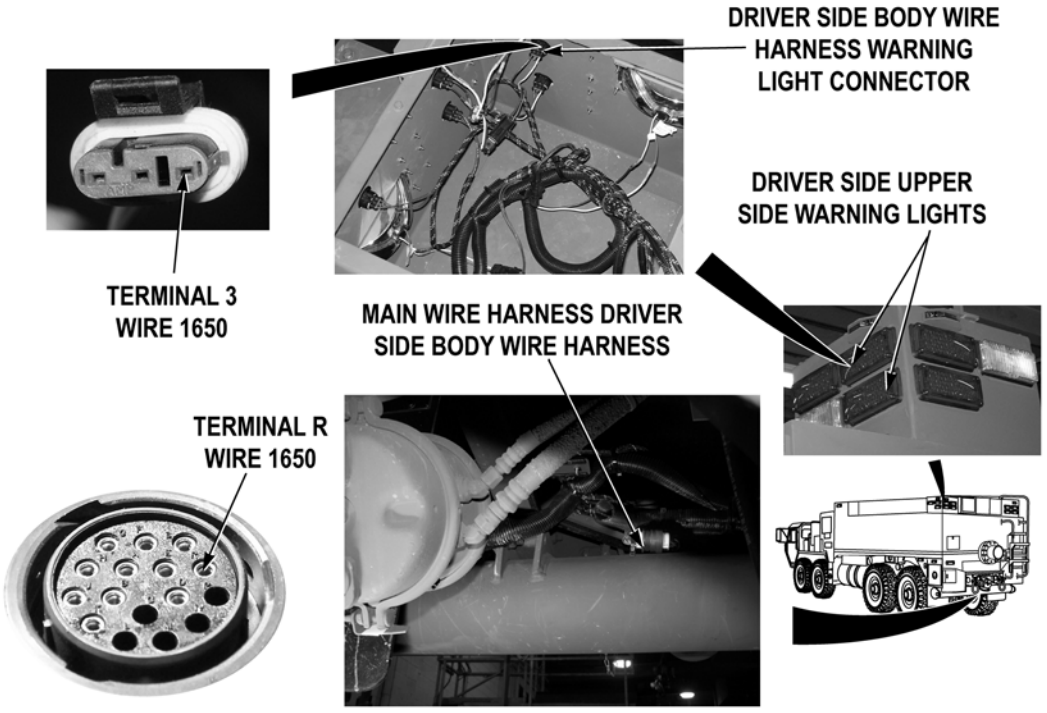
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 24. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove driver side rear light bezel cover (WP 0337). Disconnect driver side body wire harness side warning light connector from a non-operating upper side warning light (WP 0229). With a test lead set, check for continuity across wire 2640 (black) from driver side body wire harness warning light connector to a known good ground.

If there is no continuity, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

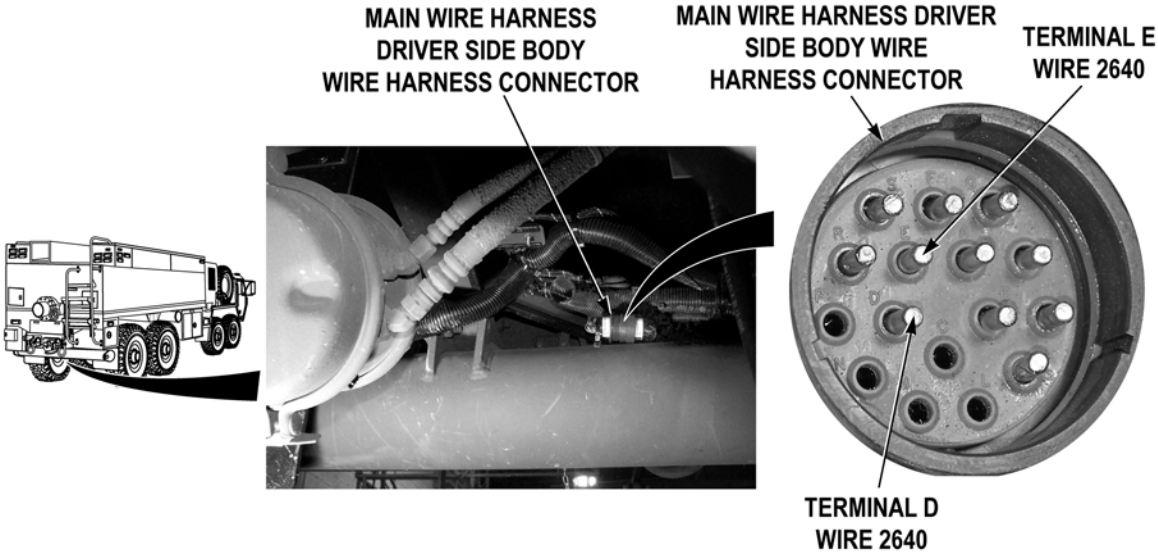


Step 25. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across driver side body wire harness wire 1650 (yellow) from driver side body wire harness warning light connector, terminal 3 to driver side body wire harness connector, terminal R.

a. If there is continuity, repair wire 1650 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1650 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 26. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2640 (black) from main wire harness driver side body wire harness connector, terminals D and E to a known good ground.

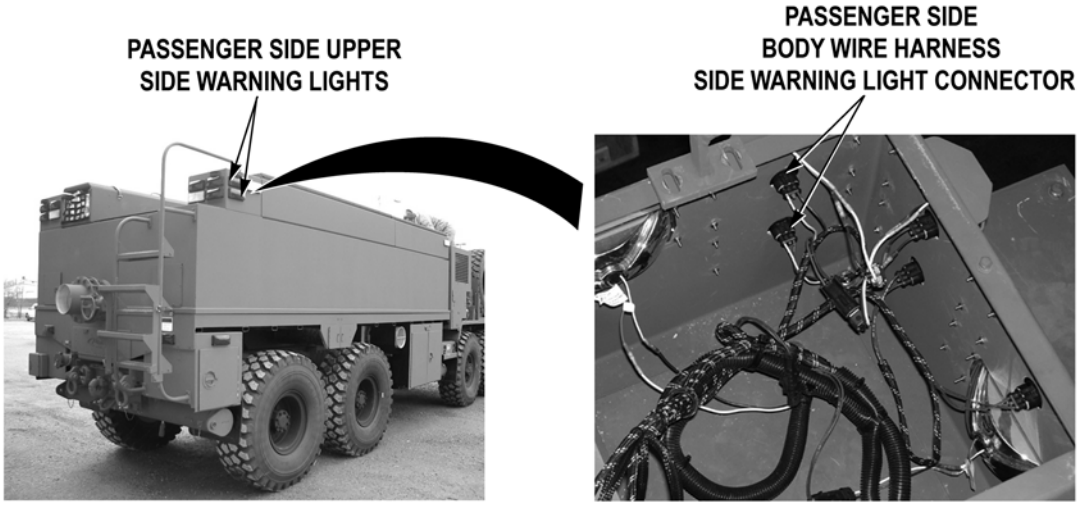
a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 27. Check if at least one passenger side upper side warning light operates.

a. If both passenger side upper side warning lights do not operate, go to Step 30.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



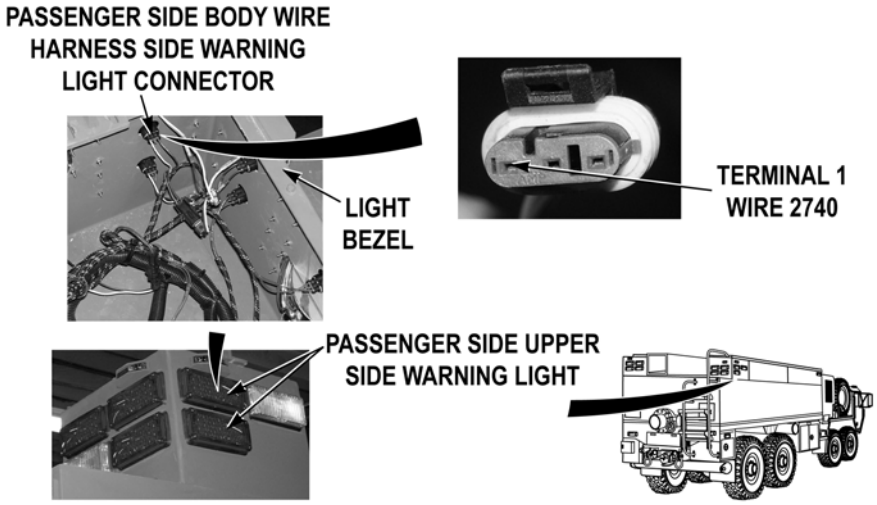
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 28. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0007). Turn Service Drive Lights Off (TM 9-2320-279-10). Remove passenger side light bezel cover (WP 0337). Disconnect passenger side body wire harness side warning light connector from operating side warning light (WP 0229). Disconnect passenger side body wire harness side warning light connector from non-operating upper side warning light (WP 0229). Connect passenger side body wire harness side warning light connector that was disconnected from operating warning light to non-operating side warning light. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and SIDE WARNING switches to on position (WP 0004). Check if non-operating warning light operates.

If non-operating warning light does not operate while connected to operating warning light connector, replace non-operating warning light (WP 0229).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

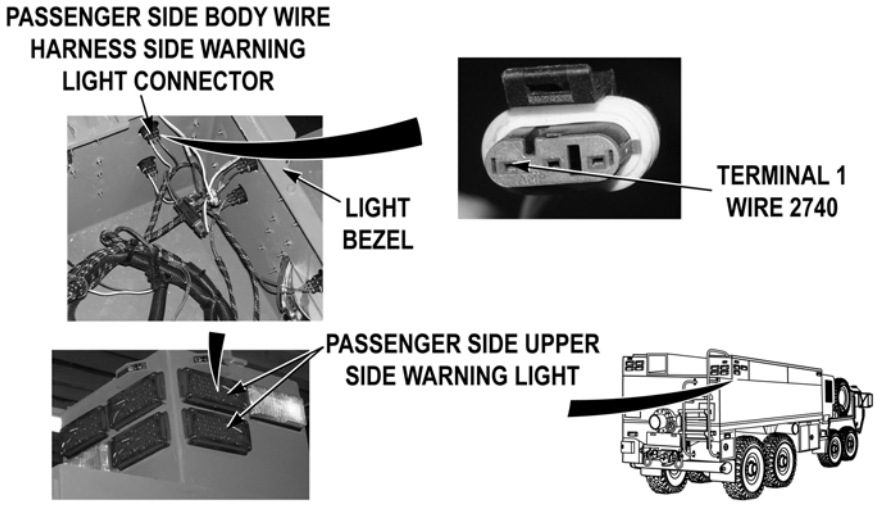


Step 29. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove passenger side light bezel cover (WP 0337). Disconnect passenger side body wire harness side warning light connector from non-operating upper side warning light (WP 0229). With a test lead set, check for continuity across passenger side body wire harness wire 2740 (black) from passenger side body wire harness warning light connector, terminal 1 to a known good ground.

a. If there is continuity, repair wire 1650 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



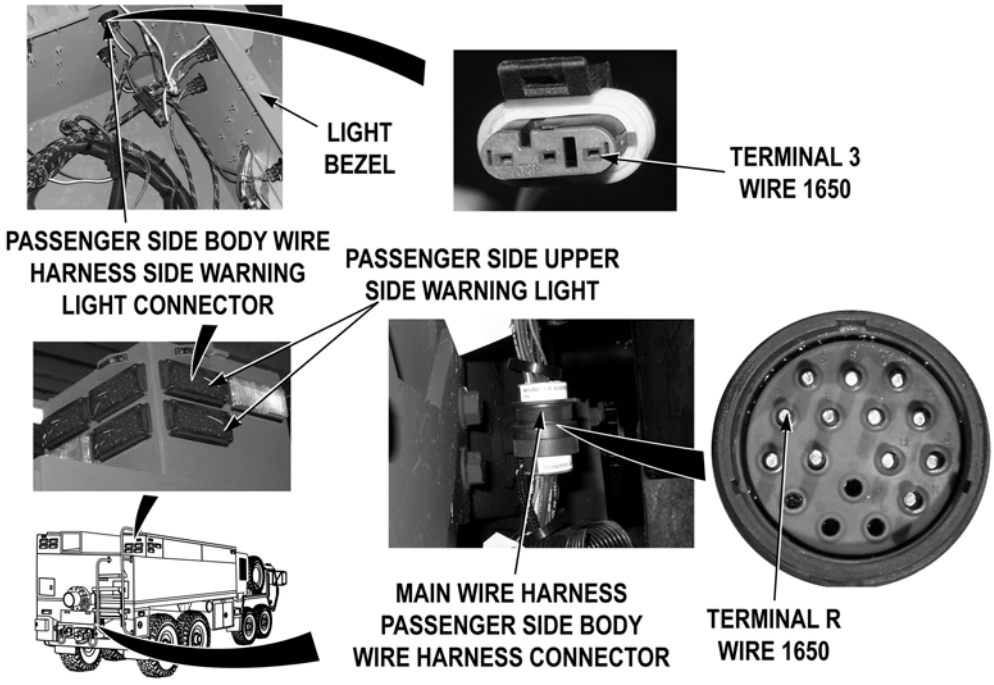
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 30. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove passenger side light bezel cover (WP 0337). Disconnect passenger side body wire harness side warning light connector from non-operating upper side warning light (WP 0229). With a test lead set, check for continuity across passenger side body wire harness wire 2740 (black) from passenger side body wire harness warning light connector, terminal 1 to a known good ground.

If there is no continuity, go to Step 32.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

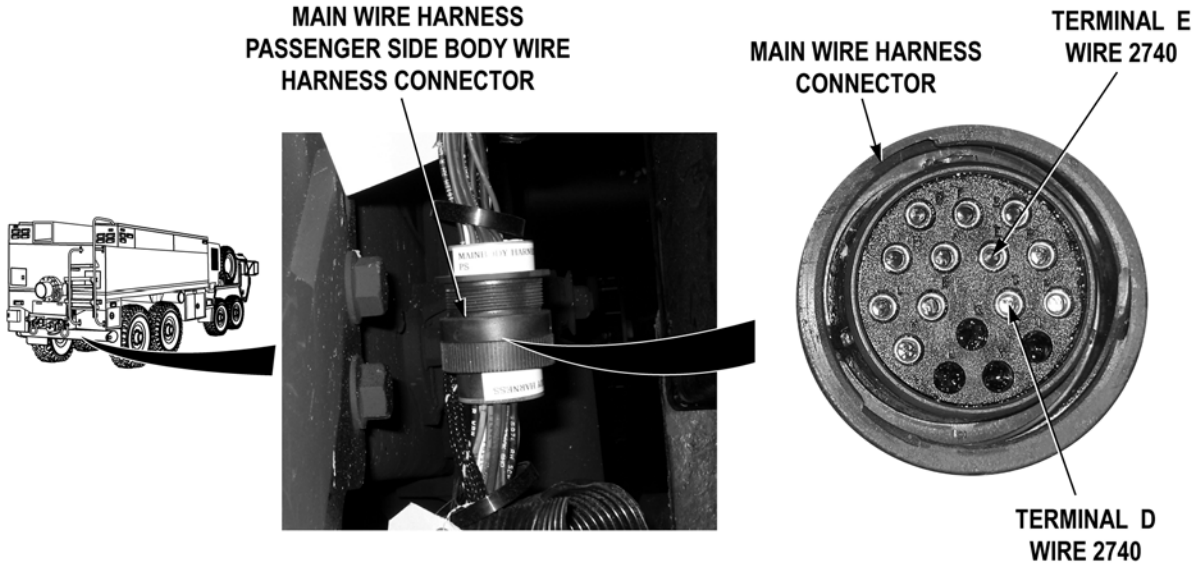


Step 31. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across passenger side body wire harness wire 1650 (yellow) from warning light connector, terminal 3 to passenger side body wire harness connector, terminal R.

a. If there is continuity, repair wire 1650 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1650 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

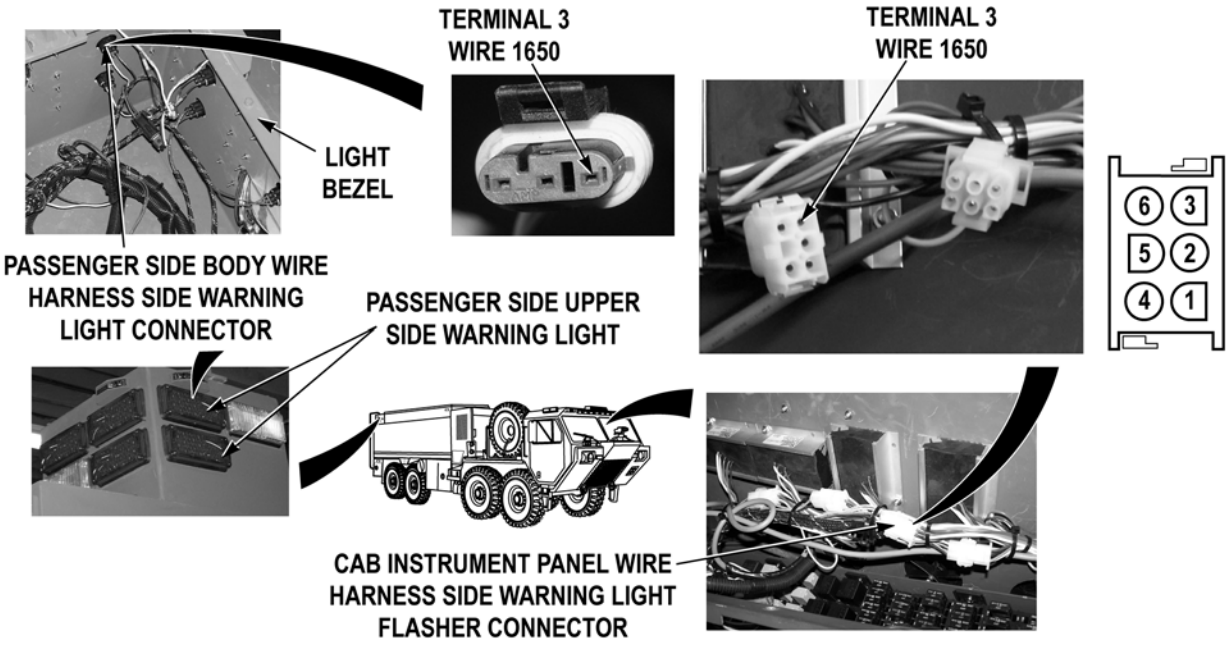
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 32. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from main wire harness passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

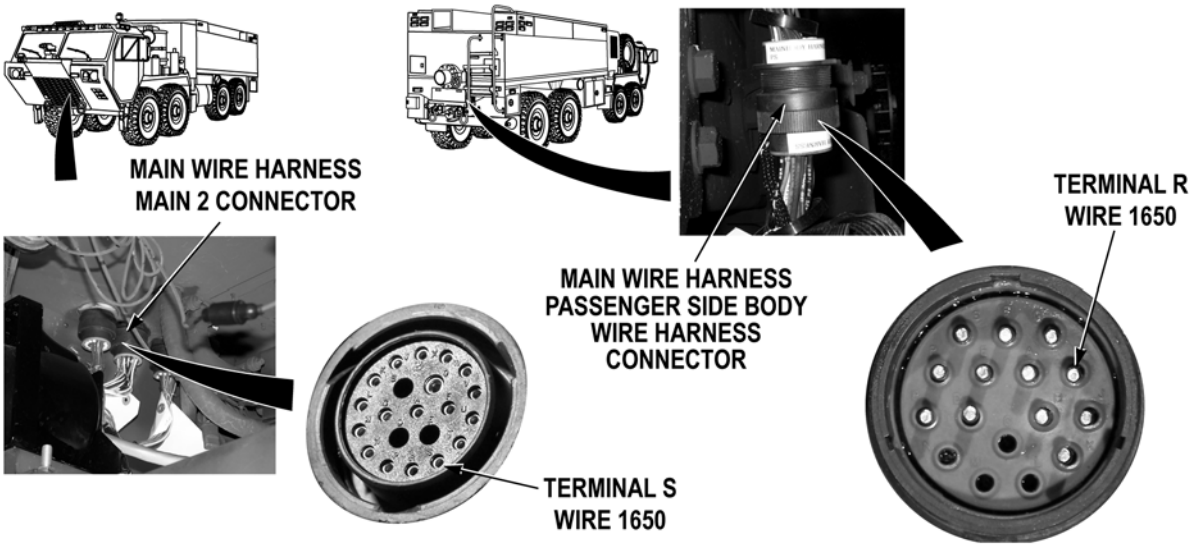
NOTE

Driver side and passenger side warning lights checked same way. Passenger side shown.

Step 33. Put EMERG MASTER and SIDE WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove driver side or passenger side rear light bezel cover (WP 0337). Disconnect driver side or passenger side body wire harness side warning light connector from one of the upper side warning lights (WP 0229). Remove cab instrument panel A (WP 0203). Disconnect cab instrument panel wire harness side warning light flasher unit connector. With a test lead set, check for continuity across wire 1650 (yellow) from main wire harness warning light connector, terminal 3 to cab instrument panel wire harness side warning light flasher connector, terminal 3.

If there is continuity, replace side warning light flasher unit (WP 0194).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 34. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 1650 (yellow) from main wire harness passenger side body wire harness connector, terminal R to main 2 connector, terminal S.

a. If there is no continuity, repair wire 1650 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is continuity, repair wire 1650 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install light bezel covers (WP 0337) (if removed)
2. Install cab instrument panel A (WP 0203)
3. Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

WARNING LIGHTS (UPPER REAR) DO NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0098
WP 0194
WP 0197
WP 0203
WP 0229

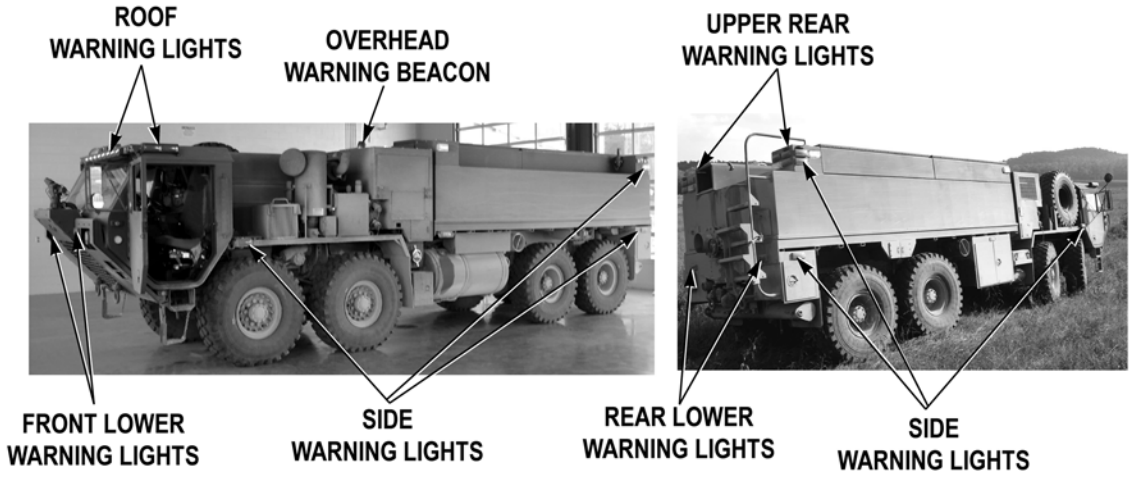
References (continued)
WP 0240
WP 0242
WP 0279
WP 0280
WP 0287
WP 0293
WP 0299
WP 0337

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING LIGHTS (UPPER REAR) DO NOT OPERATE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and UPPER REAR WARNING switches to on position (WP 0004). Check if at least one upper rear warning light operates.

If at least one upper rear warning light operates, go to Step 12.

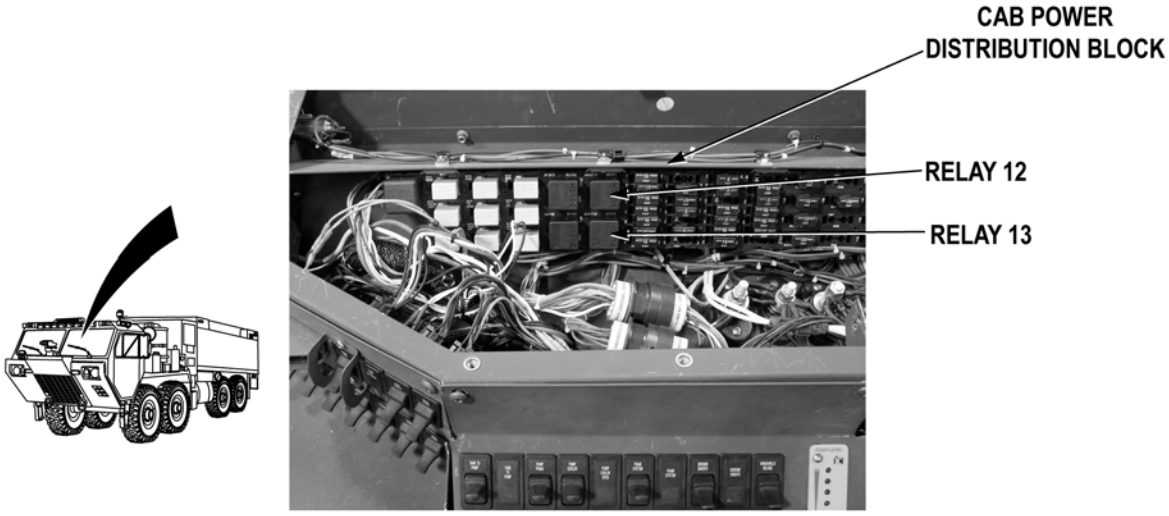
Step 2. Put OVERHEAD WARNING switch to on position (WP 0004). Check if overhead warning beacon operates.

If overhead warning beacon operates, go to Step 5.

Step 3. Put F/R LOWER WARNING, ROOF EMERGENCY LIGHTS, and SIDE WARNING switches to on position (WP 0004). Check if front, rear, roof, and/or side warning lights operate.

If front, rear, roof, and/or side warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0098).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

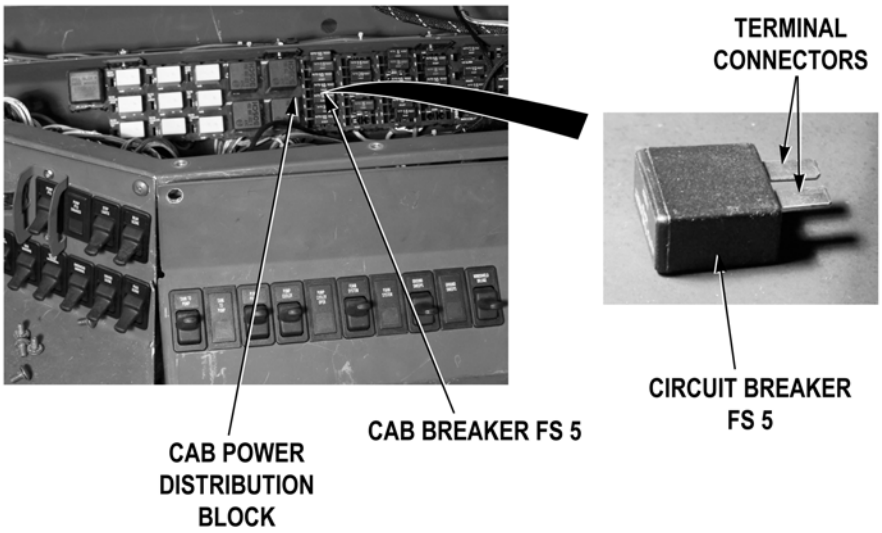
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Put EMERG MASTER, ROOF EMERGENCY LIGHTS, F/R LOWER WARNING, SIDE WARNING, UPPER REAR WARNING, and OVERHEAD WARNING switches to off position (WP 0004). Remove cab instrument panel A (WP 0203). Swap relays 12 and 13 (WP 0242). Put EMERG MASTER and UPPER REAR switches to on position (WP 0004). Check if upper rear warning lights operate.

a. If upper rear warning lights operate, return relays to original positions and replace relay 13 (WP 0242).

b. If upper rear warning lights do not operate, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



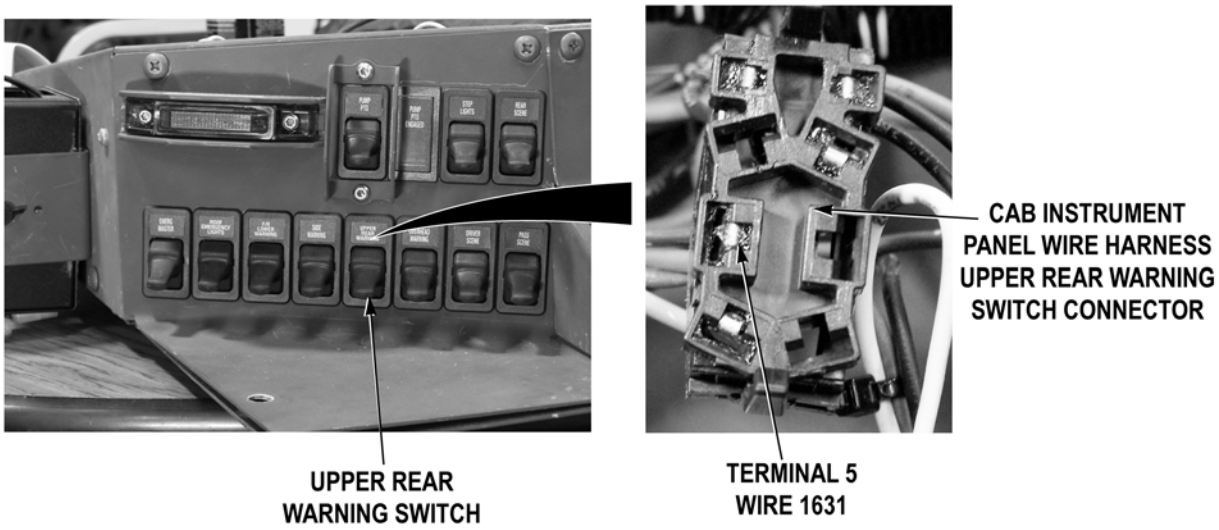
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Put EMERG MASTER, UPPER REAR WARNING, and OVERHEAD WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 5 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 5 (WP 0240).

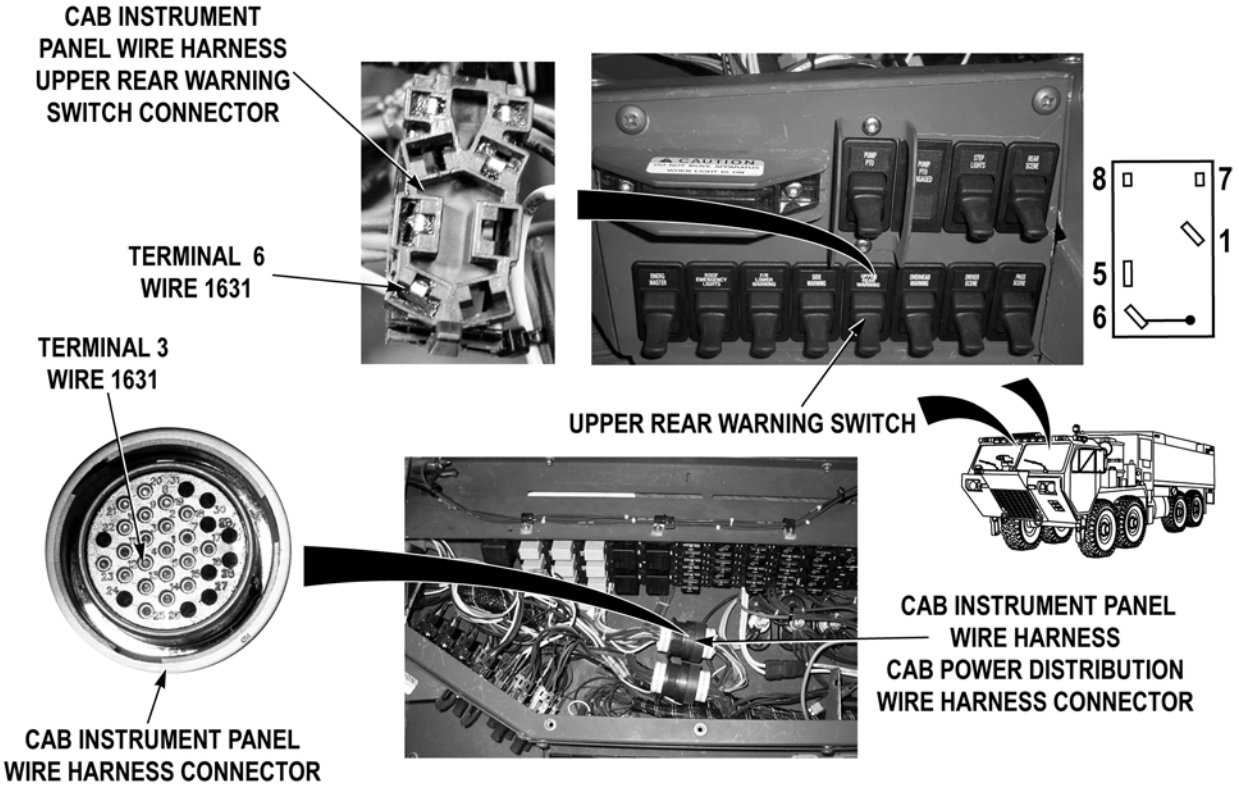
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Install circuit breaker FS 5 (WP 0240). Remove cab instrument panel C (WP 0203). Disconnect cab instrument panel wire harness UPPER REAR WARNING switch connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position. (WP 0004). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1631 (brown) at cab instrument panel wire harness UPPER REAR WARNING switch connector, terminal 5 and a known good ground.

If 22 to 28 VDC are present, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

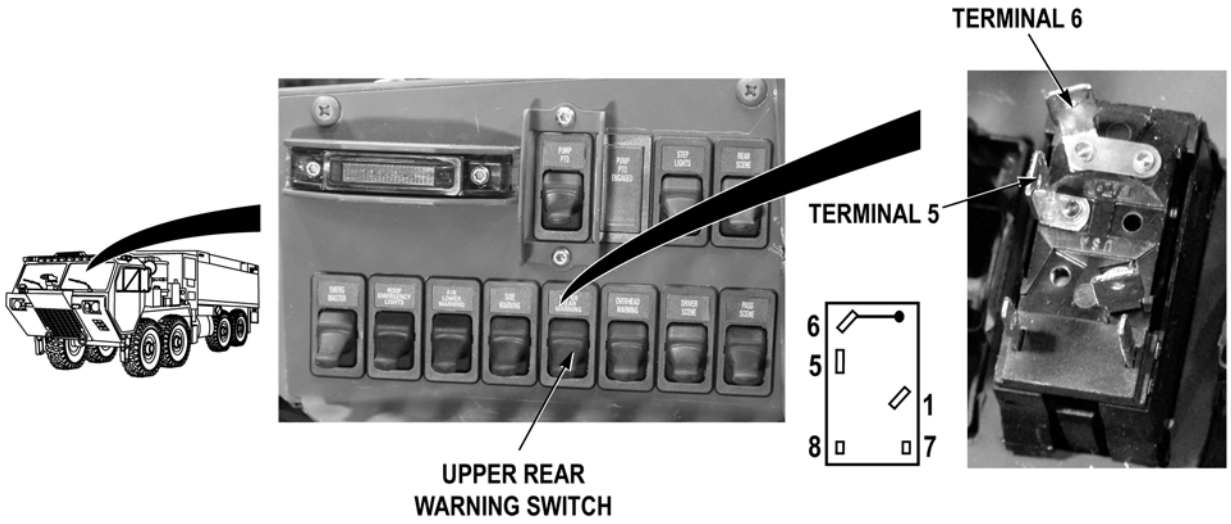


Step 7. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. Check for continuity across cab instrument panel wire harness wire 1631 (brown) from cab instrument panel wire harness connector, terminal 3 to UPPER REAR WARNING switch connector, terminal 6.

a. If there is continuity, repair wire 1631 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1631 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

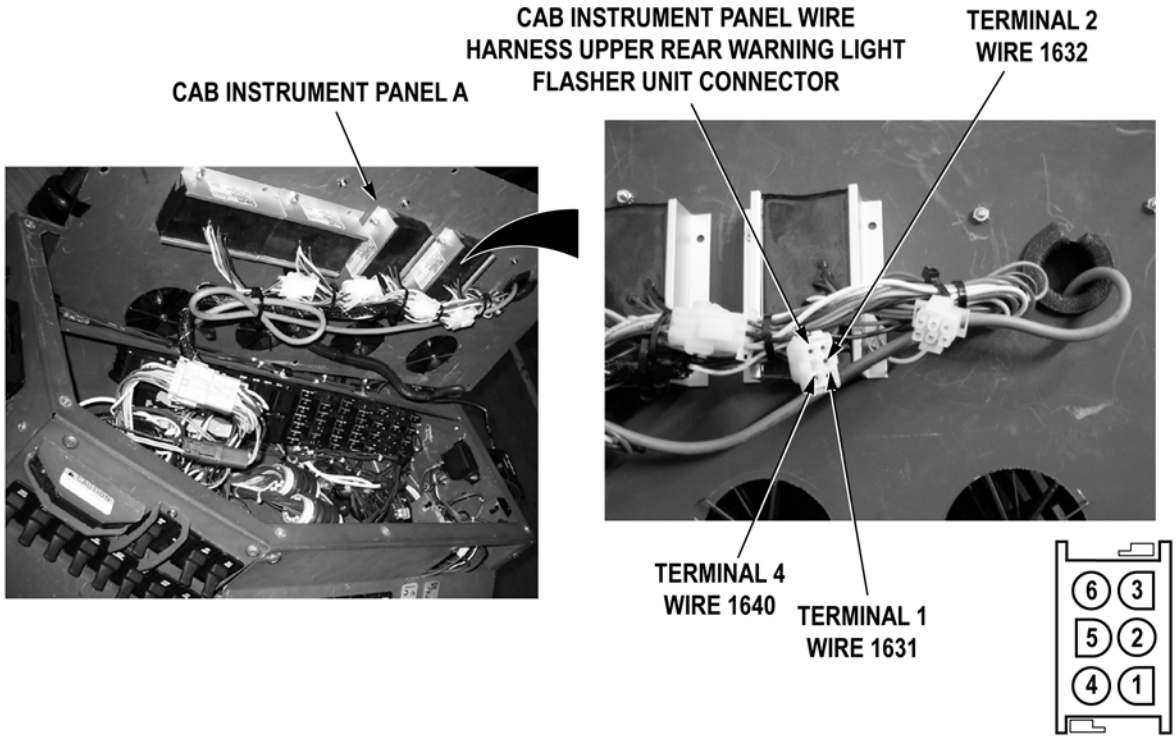
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Put EMERG MASTER switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Put battery disconnect switch to off position (WP 0007). Check for continuity across UPPER REAR WARNING switch, from terminal 5 to terminal 6, while switch is in on position.

If there is no continuity, replace UPPER REAR WARNING switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 9. Disconnect cab instrument panel wire harness upper rear warning light flasher unit connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER switch to on position (WP 0004). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1631 (brown) at upper rear warning light flasher unit connector, terminal 1 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1631 in cab instrument panel wire harness if repairable, (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

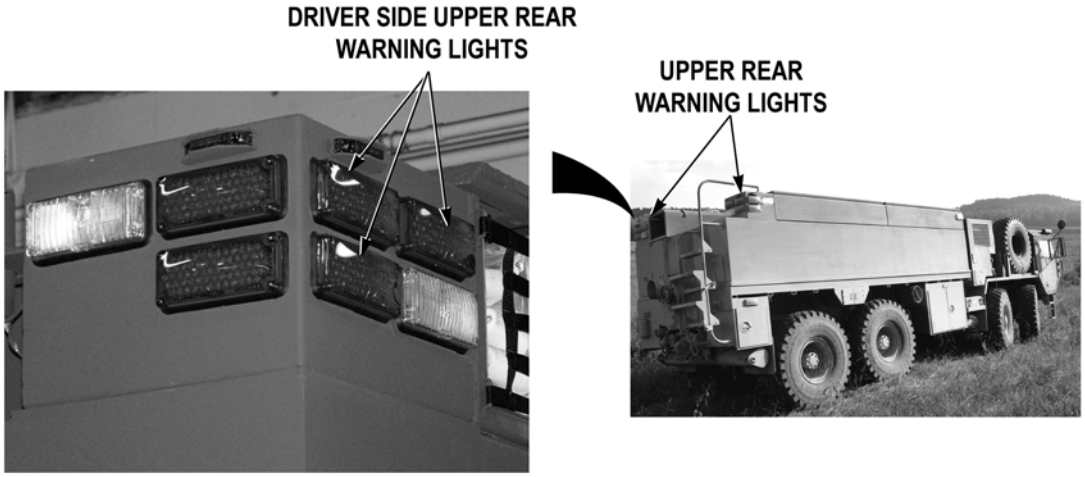
Step 10. Put UPPER REAR WARNING switch to on position (WP 0004). Check for 22 to 28 VDC between cab instrument panel wire harness wire 1632 (brown) at upper rear warning light flasher unit connector, terminal 2 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1632 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

Step 11. Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across wire 1640 (black) from cab instrument panel wire harness upper rear warning light flasher unit connector, terminal 4 to a known good ground.

a. If there is continuity, replace upper rear warning light flasher unit (WP 0194).

b. If there is no continuity, repair wire 1640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).



Step 12. Check if all three driver side upper rear warning lights operate.

a. If all three driver side upper rear warning lights are operating, go to Step 21.

Step 13. Check if at least one driver side upper rear warning light operates.

a. If all three driver side upper rear warning lights do not operate, go to Step 16.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

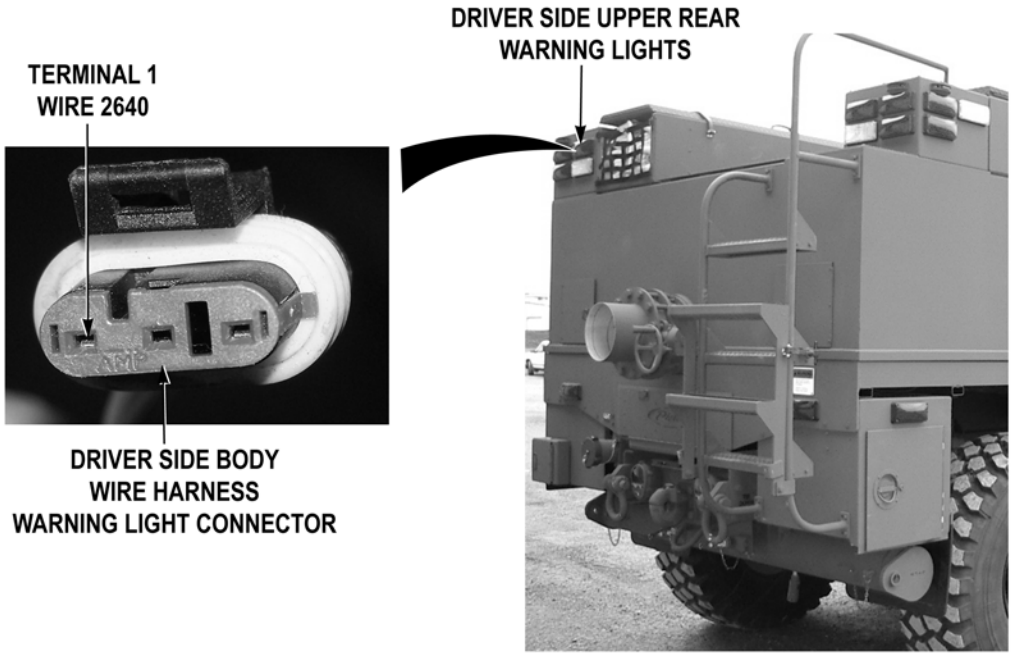
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 14. Note position of non-operating upper rear warning light. Remove driver side rear light bezel cover (WP 0337). Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Disconnect operating driver side body wire harness upper rear warning light connector from warning light (WP 0229). Disconnect non-operating driver side body wire harness upper rear warning light connector from warning light (WP 0229). Connect non-operating upper rear warning light to operating driver side body wire harness connector. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and UPPER REAR WARNING switches to on position (WP 0004). Check if upper rear warning light in non-operating position operates.

If warning light connected to non-operating driver side body wire harness connector operates, replace non-operating warning light (WP 0229).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

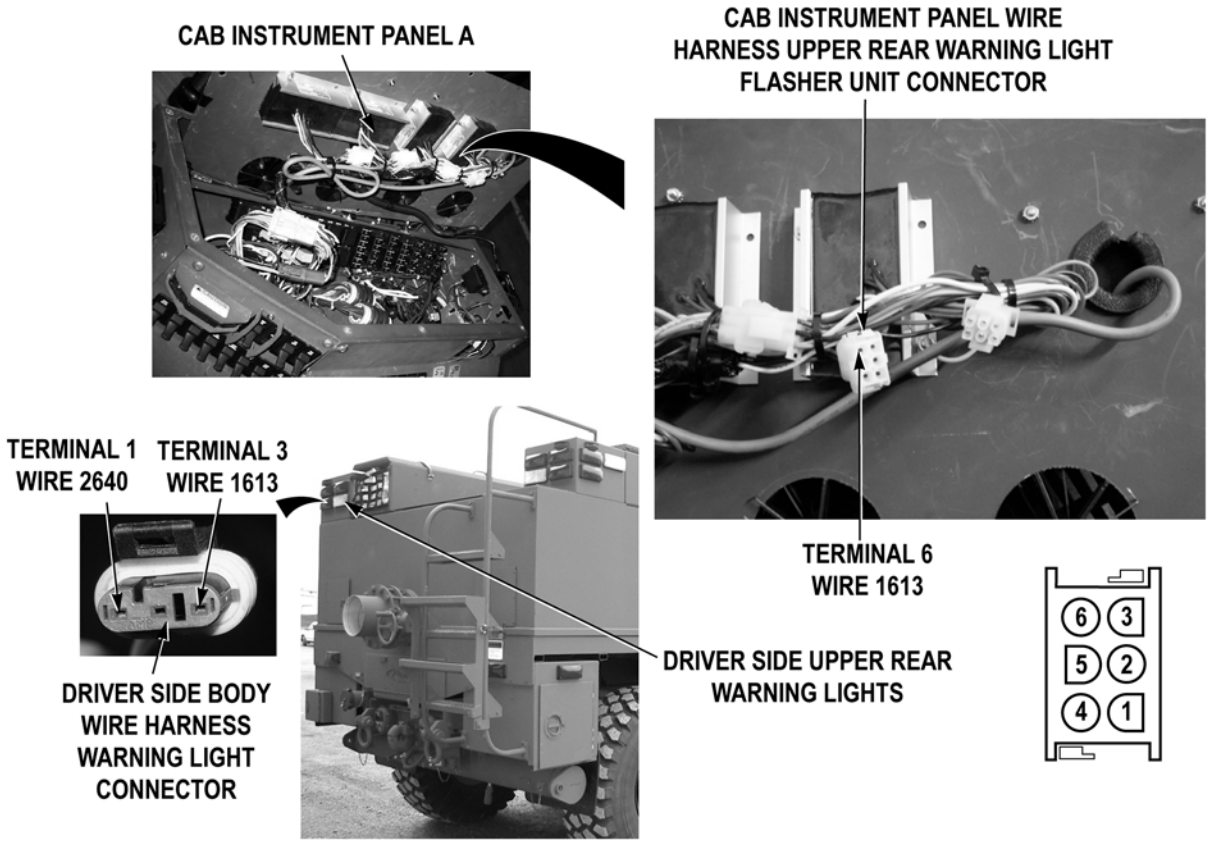
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 15. Note position of non-operating upper rear warning light. Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect driver side body wire harness upper rear warning light connector from non-operating upper rear warning light (WP 0229). Check for continuity across driver side body harness wire 2640 (black) from non-operating warning light connector, terminal 1 to a known good ground.

a. If there is continuity, repair wire 1613 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



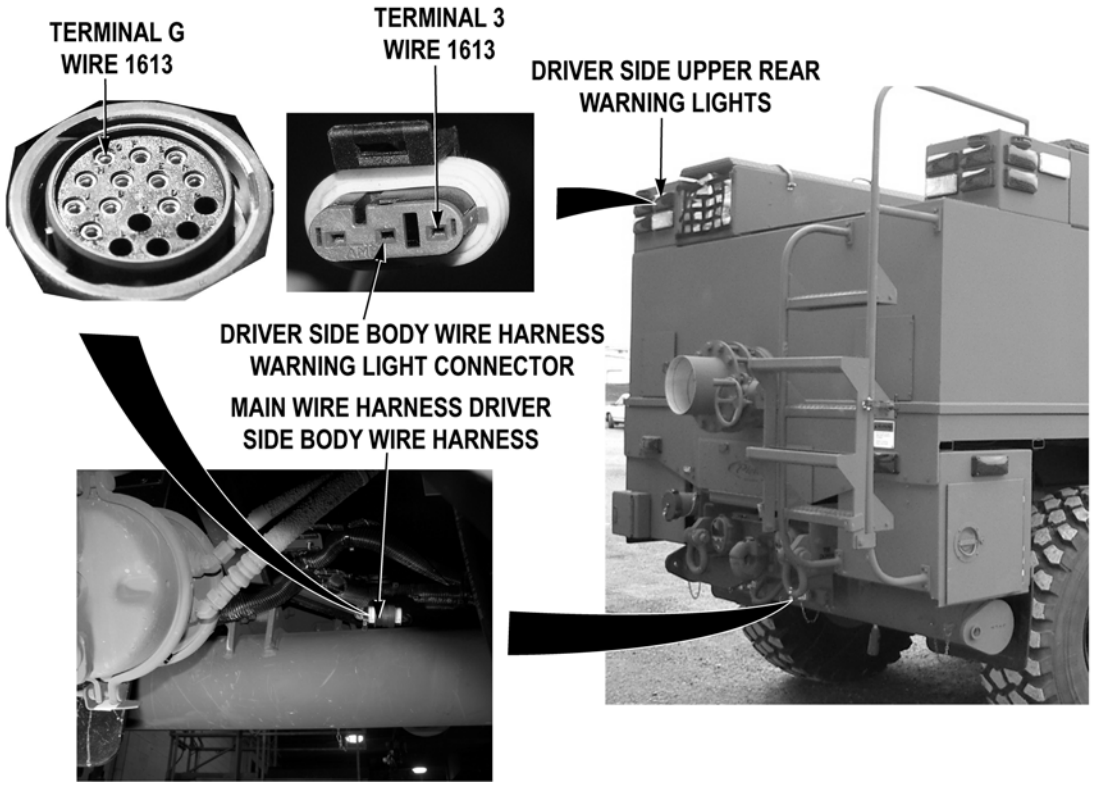
Step 16. Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove a non-operating upper rear warning light (WP 0229). Check for continuity across driver side body wire harness wire 2640 (black) from non-operating warning light connector, terminal 1 to a known good ground.

If there is no continuity, go to Step 20.

Step 17. Remove cab instrument panel A (WP 0203). Disconnect cab instrument panel wire harness upper rear warning light flasher unit connector. With a test lead set, check for continuity across wire 1613 (white) from driver side body wire harness warning light connector, terminal 3 to cab instrument panel wire harness side warning light flasher unit connector, terminal 6.

If there is continuity, replace upper rear warning light flasher unit (WP 0194).

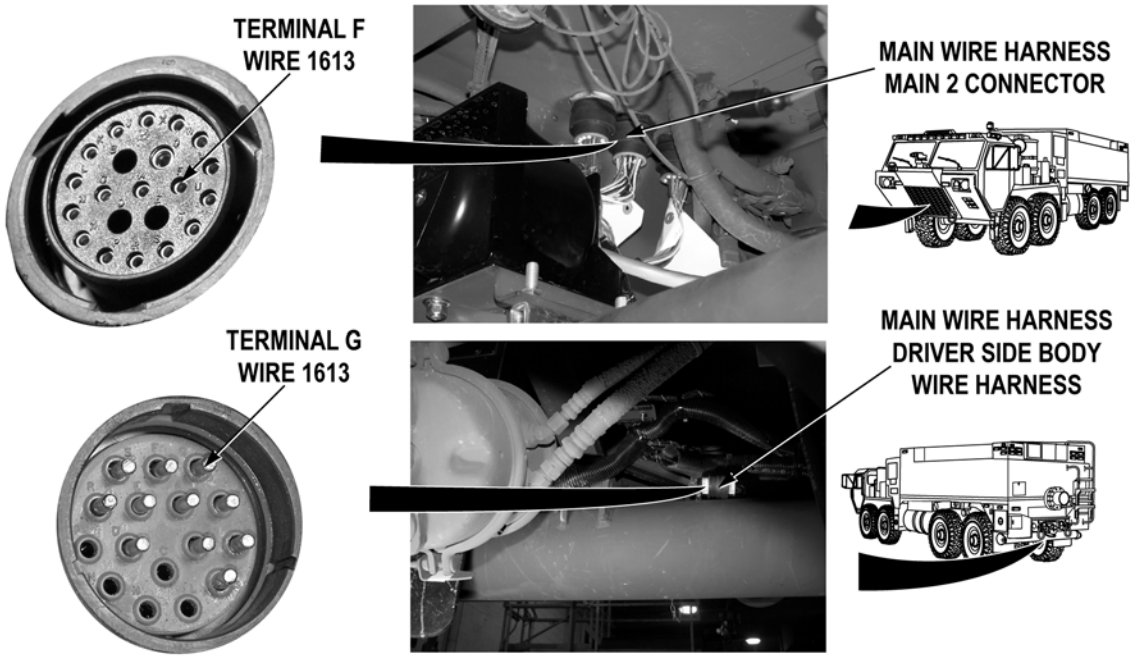
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Disconnect main wire harness driver side body harness connector. Check for continuity across driver side body harness wire 1613 (white) from warning light connector, terminal 3 to driver side body wire harness connector, terminal G.

If there is no continuity, repair wire 1613 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

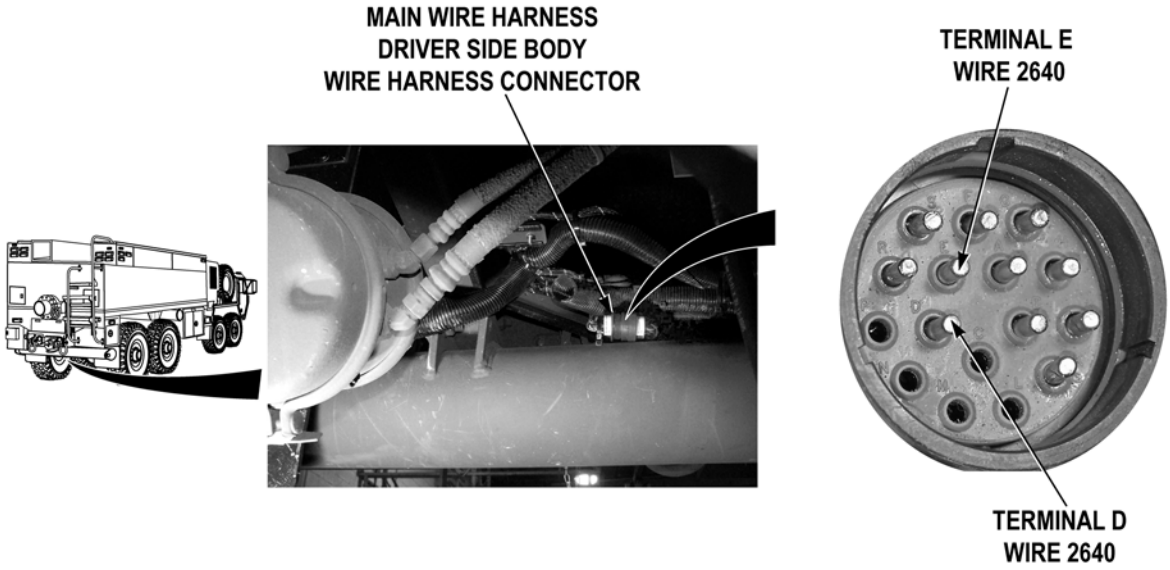


Step 19. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. Check for continuity across main wire harness wire 1613 (white) from driver side body wire harness connector, terminal G to main wire harness main 2 connector, terminal F.

a. If there is continuity, repair wire 1613 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1613 in maine wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 20. Disconnect main wire harness driver side body wire harness connector. Check for continuity across main wire harness wire 2640 (black) from driver side body wire harness connector, terminals D and E to a known good ground.

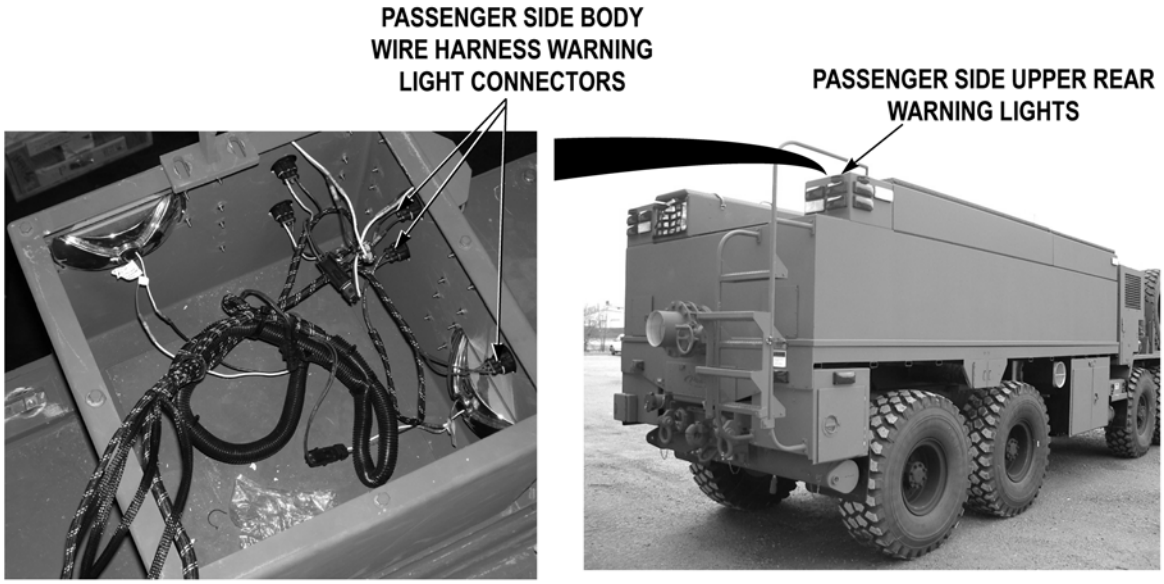
a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 21. Check if at least one passenger side upper rear warning light operates.

If all three passenger side upper rear warning lights do not operate, go to Step 24.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



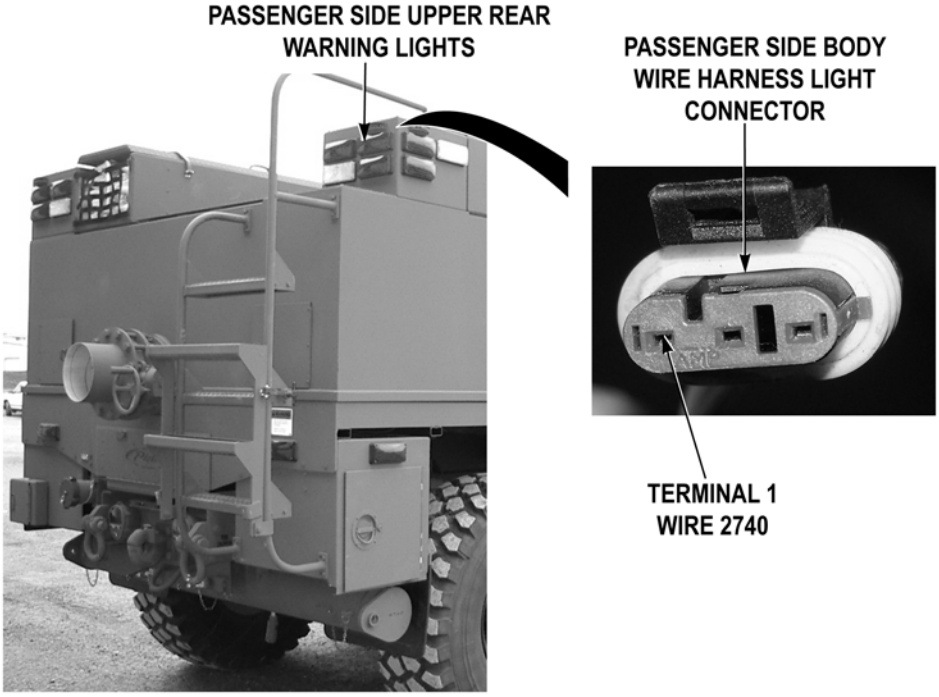
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 22. Note position of non-operating upper rear warning light. Remove passenger side light bezel cover (WP 0337). Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Disconnect operating passenger side body wire harness upper rear warning light connector from warning light (WP 0229). Disconnect non-operating passenger side body wire harness upper rear warning light connector from warning light (WP 0229). Connect non-operating upper rear warning light to operating passenger side body wire harness connector. Turn Service Drive Lights On (TM 9-2320-279-10). Put EMERG MASTER and UPPER REAR WARNING switches to on position (WP 0004). Check if upper rear warning light that is connected to operating passenger side body wire harness connector operates.

If non-operating warning light operates when connected to operating passenger side body wire harness connector, replace non-operating warning light (WP 0229).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

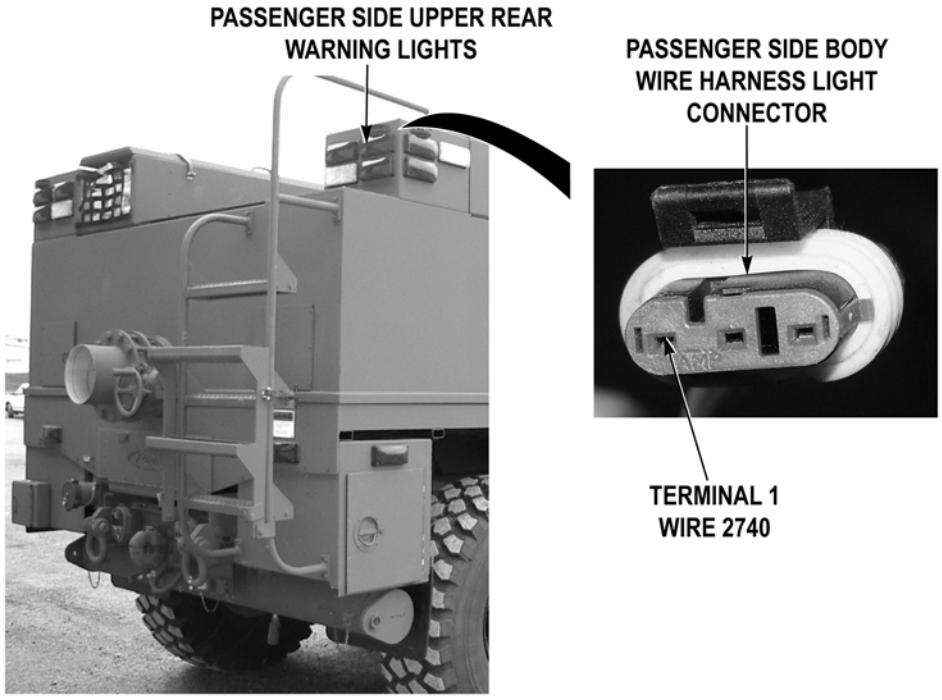


Step 23. Note position of non-operating upper rear warning light. Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove non-operating upper rear warning light (WP 0229). Check for continuity across passenger side body wire harness wire 2740 (black) from non-operating warning light connector, terminal 1 to a known good ground.

a. If there is continuity, repair wire 1612 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



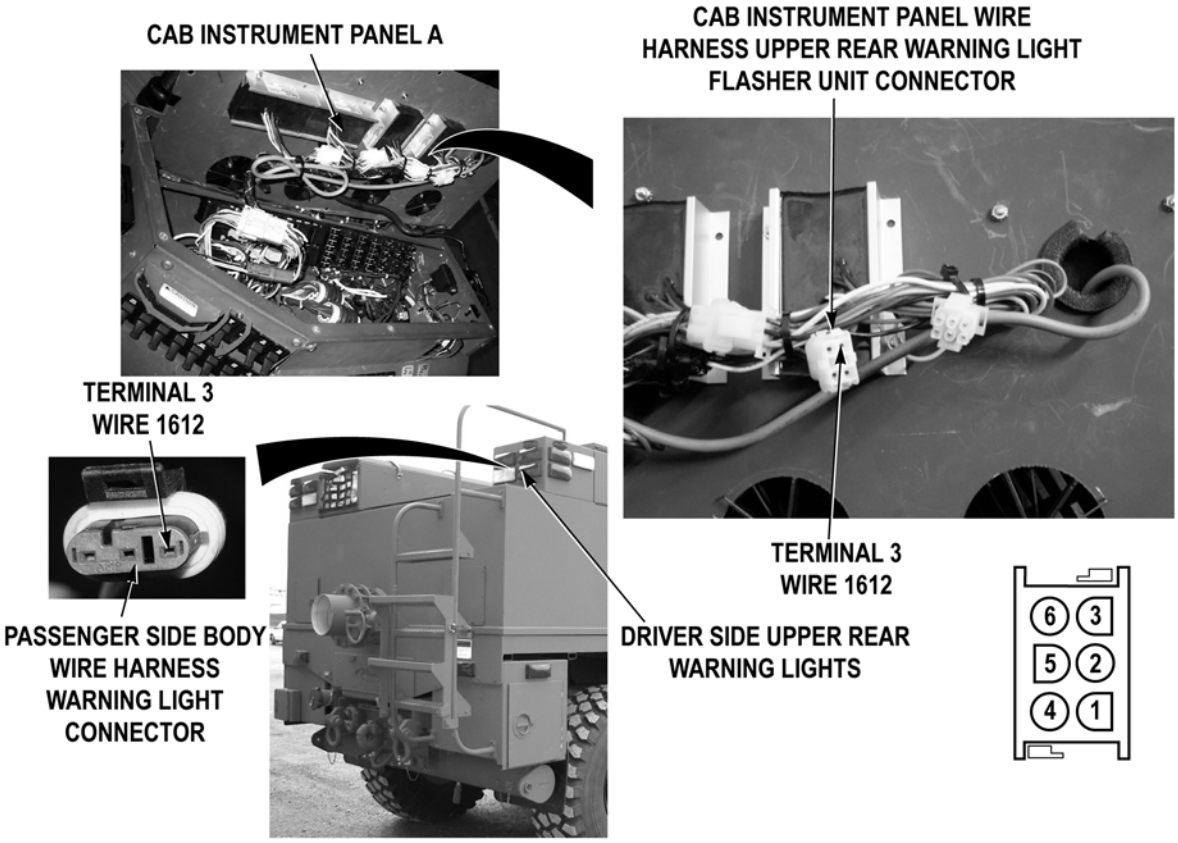
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 24. Put EMERG MASTER and UPPER REAR WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove a non-operating upper rear warning light (WP 0229). Check for continuity across passenger side body wire harness wire 2740 (black) from non-operating warning light connector, terminal 1 to a known good ground.

If there is no continuity, go to Step 27.

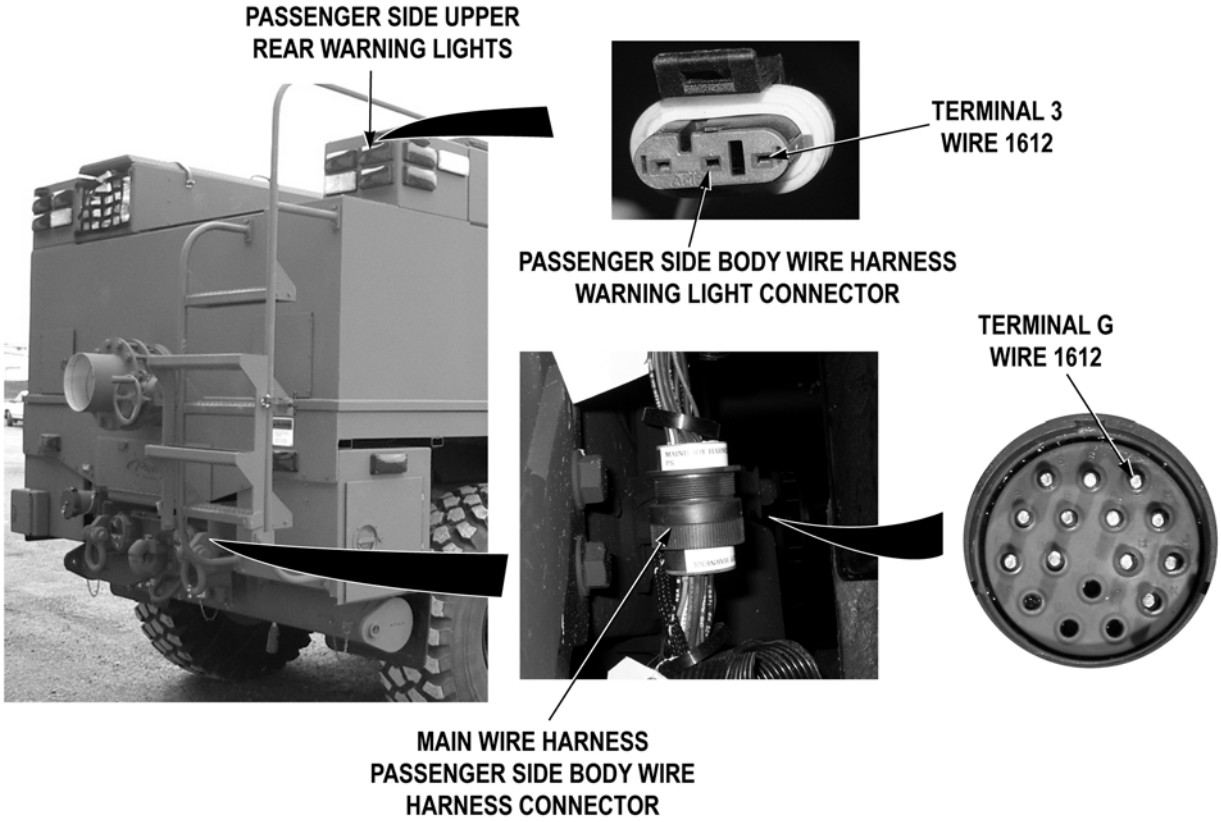
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 25. Remove cab instrument panel A (WP 0203). Disconnect cab instrument panel wire harness upper rear warning light flasher unit connector. Check for continuity across wire 1612 (black) from passenger side body wire harness warning light connector, terminal 3 to cab instrument panel wire harness side warning light flasher unit connector, terminal 3.

If there is continuity, replace upper rear warning light flasher unit (WP 0194).

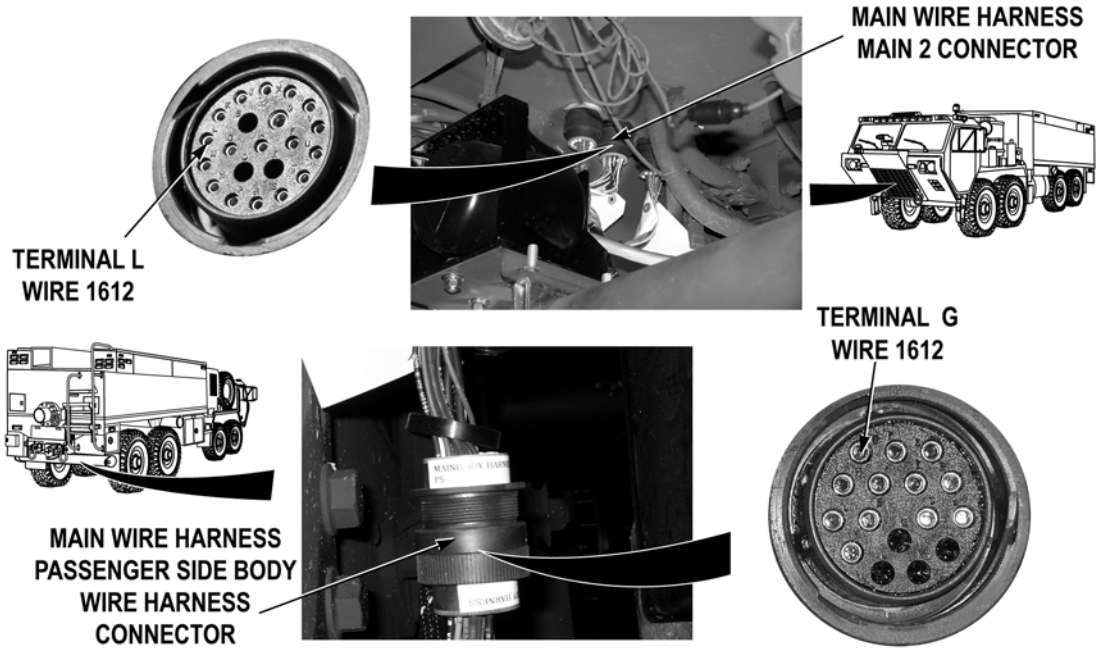
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 26. Disconnect main wire harness passenger side body wire harness connector. Check for continuity across passenger side body wire harness wire 1612 (black) from warning light connector, terminal 3 to passenger side body wire harness connector, terminal G.

If there is no continuity, repair wire 1612 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

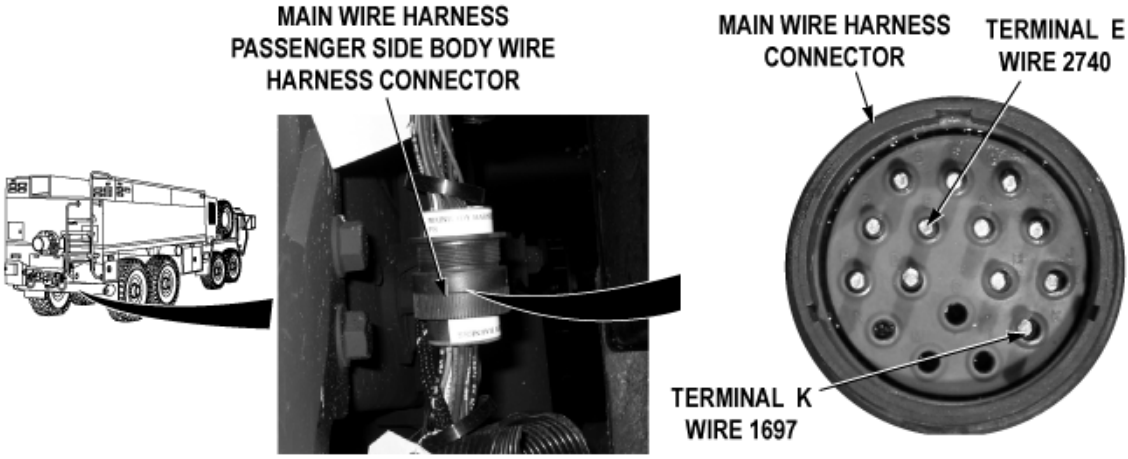


Step 27. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. Check for continuity across main wire harness wire 1612 (black) from passenger side body wire harness connector, terminal G to main wire harness main 2 connector, terminal L.

a. If there is continuity, repair wire 1612 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1612 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 28. Disconnect main wire harness passenger side body wire harness connector. Check for continuity across main wire harness wire 2740 (black) from passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install cab instrument panels A and C (WP 0203)
2. Install skid plate grille (WP 0350)
3. Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

DRIVER SIDE SCENE LIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

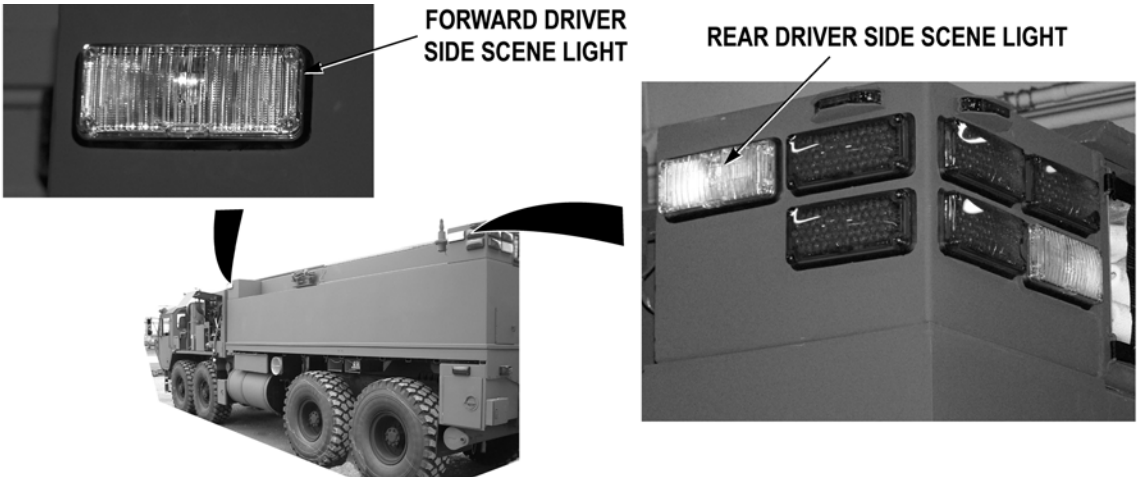
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0110
WP 0197
WP 0203
WP 0231

References (continued)
WP 0240
WP 0279
WP 0280
WP 0287
WP 0293
WP 0337

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DRIVER SIDE SCENE LIGHT(S) DOES NOT OPERATE



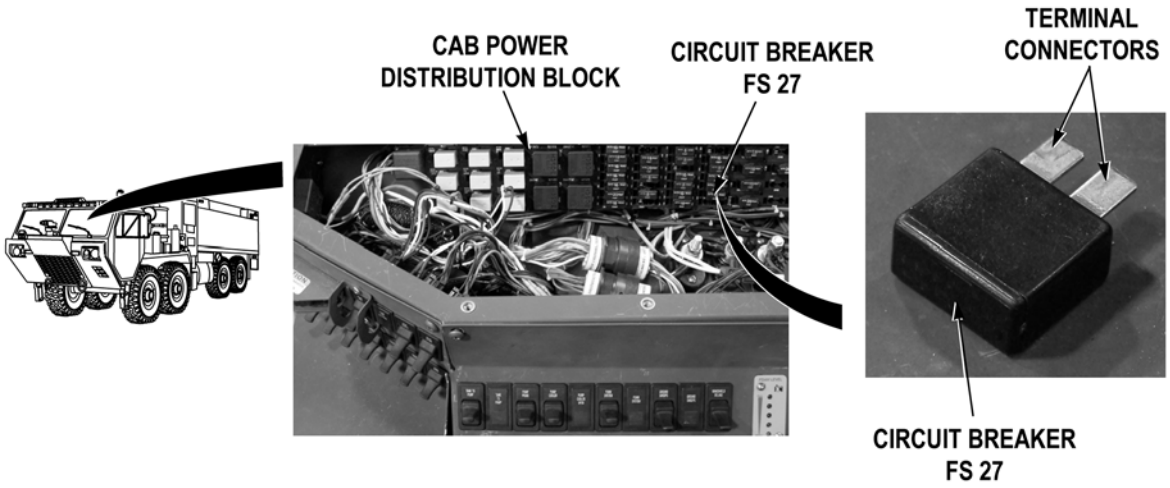
Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put DRIVER SCENE switch to on position (WP 0004). Check if at least one driver side scene light operates.

If at least one driver side scene light operates, go to Step 11.

Step 2. Push cab dome lights switch to on position (WP 0004). Check if cab dome lights illuminate.

If cab dome lights do not illuminate, troubleshoot Cab Dome Lights Do Not Operate (WP 0110).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Push cab dome lights switch to off position (WP 0004). Put DRIVER SCENE switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 27 (WP 0240). Check for continuity across circuit breaker from terminal to terminal.

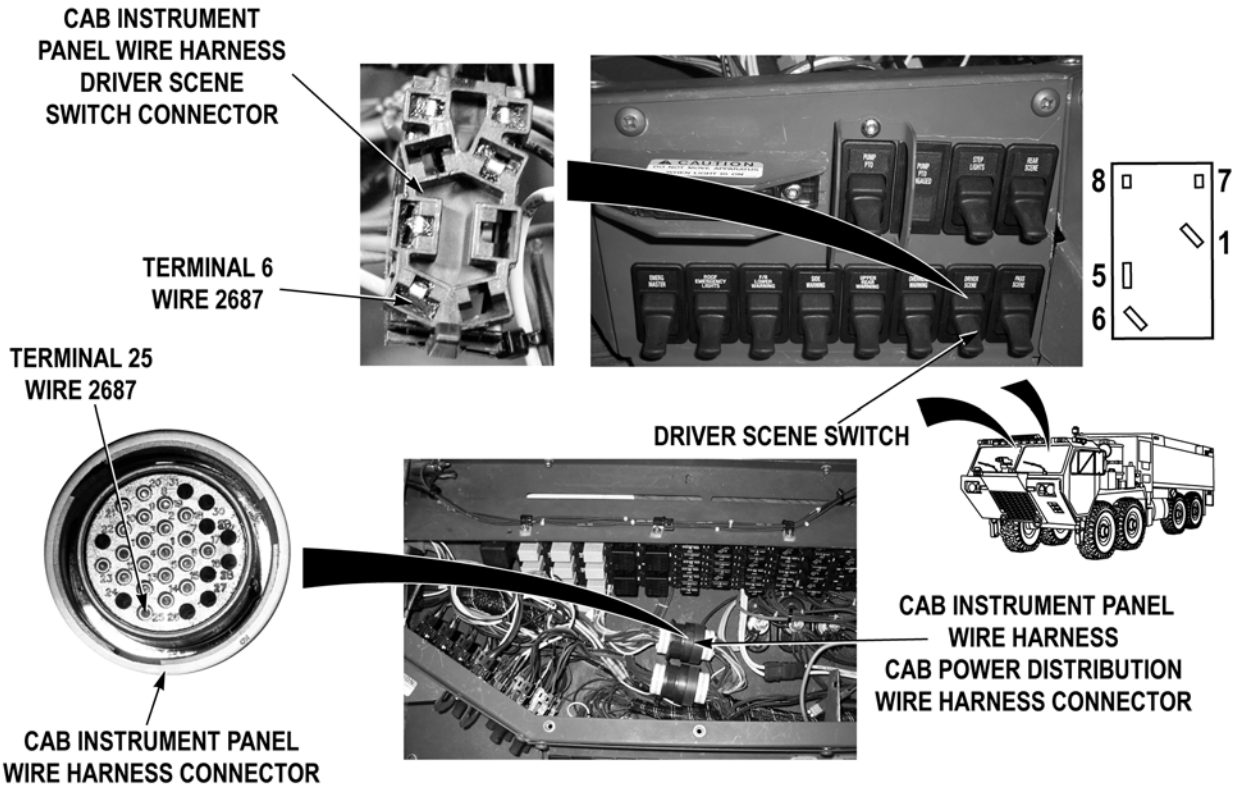
If there is no continuity, replace circuit breaker FS 27 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 4. Install circuit breaker FS 27 (WP 0240). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Disconnect cab instrument panel wire harness DRIVER SCENE switch connector. Check for 22 to 28 VDC between cab instrument panel wire harness wire 2687 (yellow) at DRIVER SCENE switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

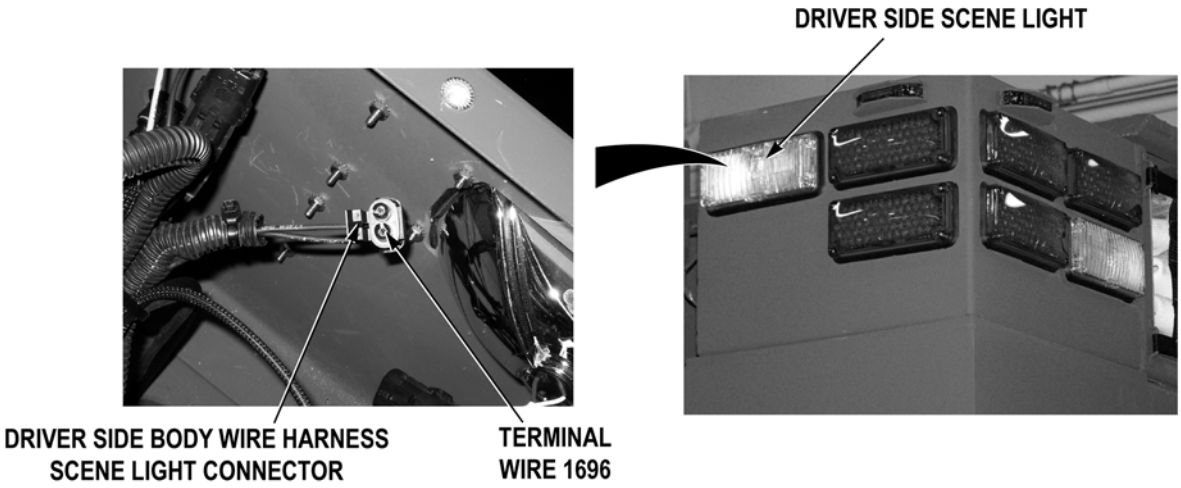


Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 2687 (yellow) from cab instrument panel wire harness connector, terminal 25 to cab instrument panel wire harness DRIVER SCENE switch connector, terminal 6.

a. If there is continuity, repair wire 2687 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2687 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

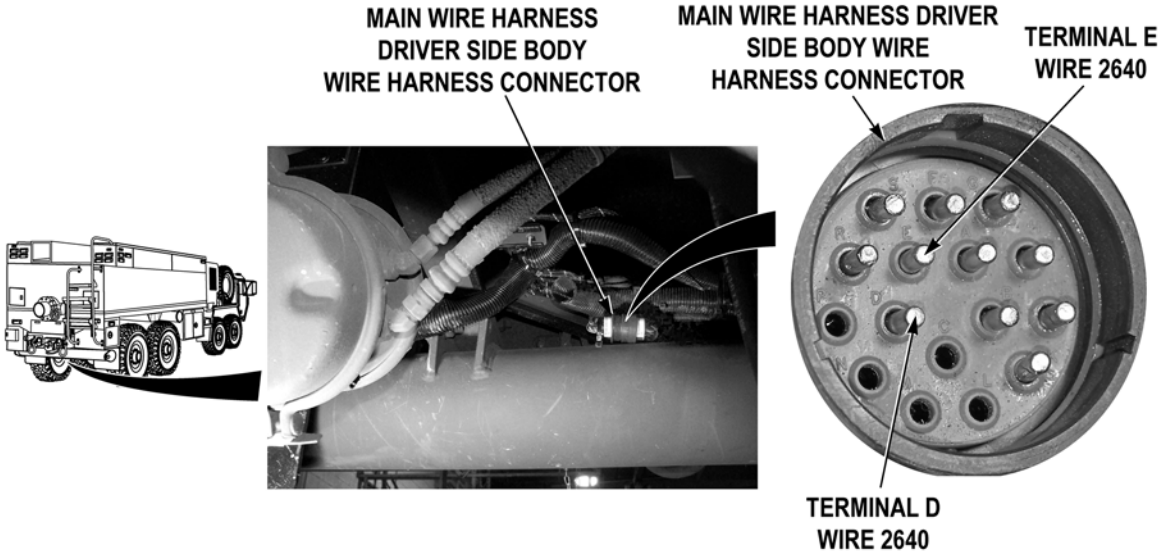
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Remove driver side rear light bezel cover (WP 0337). Disconnect driver side body wire harness from driver side scene light connector. Put DRIVER SCENE switch to on position (WP 0004). Check for 22 to 28 VDC between driver side body wire harness wire 1696 (black) at driver side body wire harness scene light connector and a known good ground.

If 22 to 28 VDC are not present, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

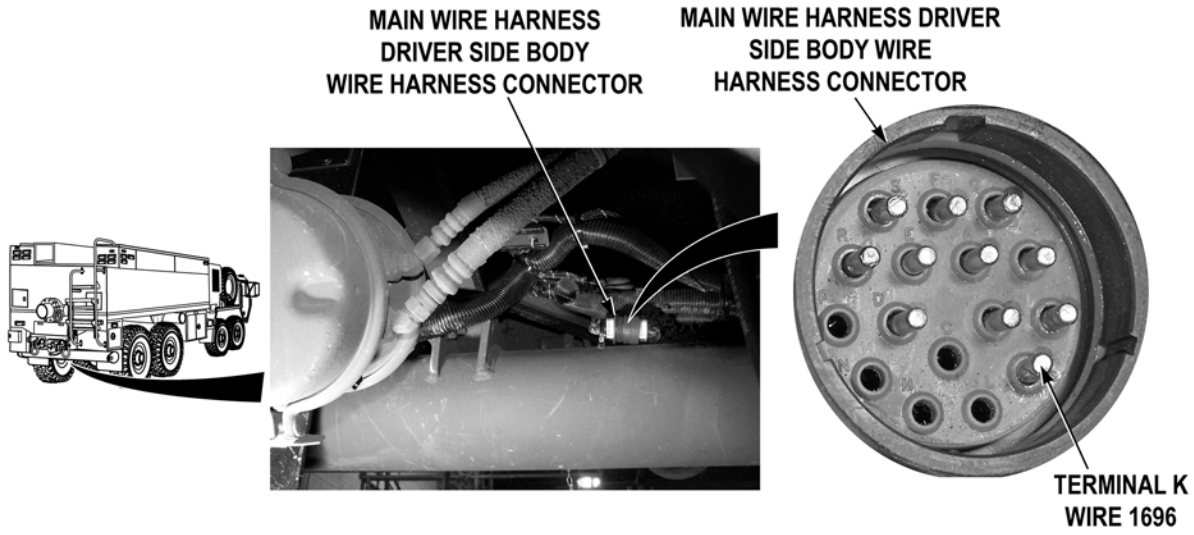


Step 7. Put DRIVER SCENE switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2640 (black) from main wire harness driver side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

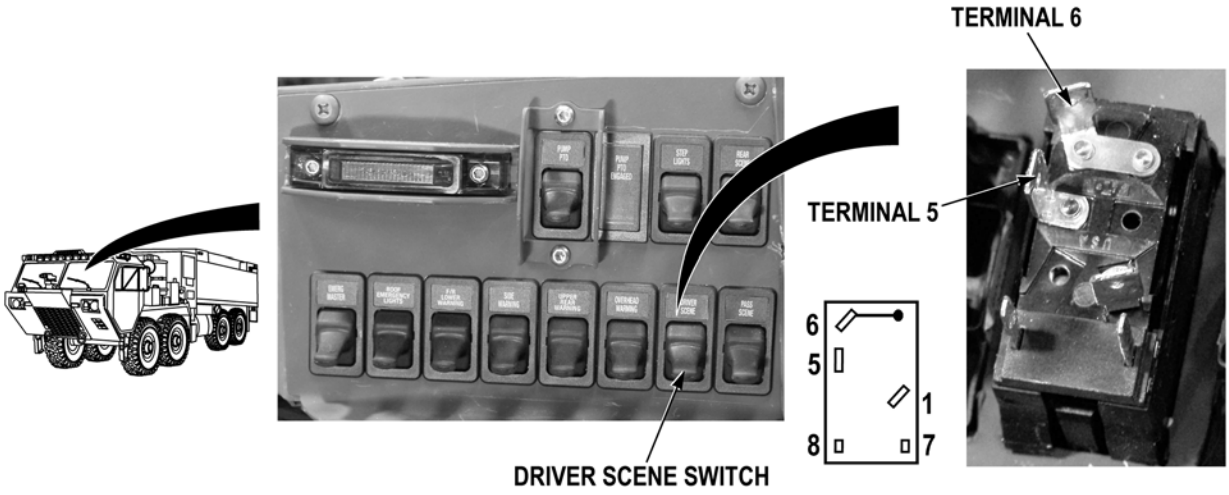
b. If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 1696 (black) at main wire harness driver side body wire harness connector, terminal K and a known good ground.

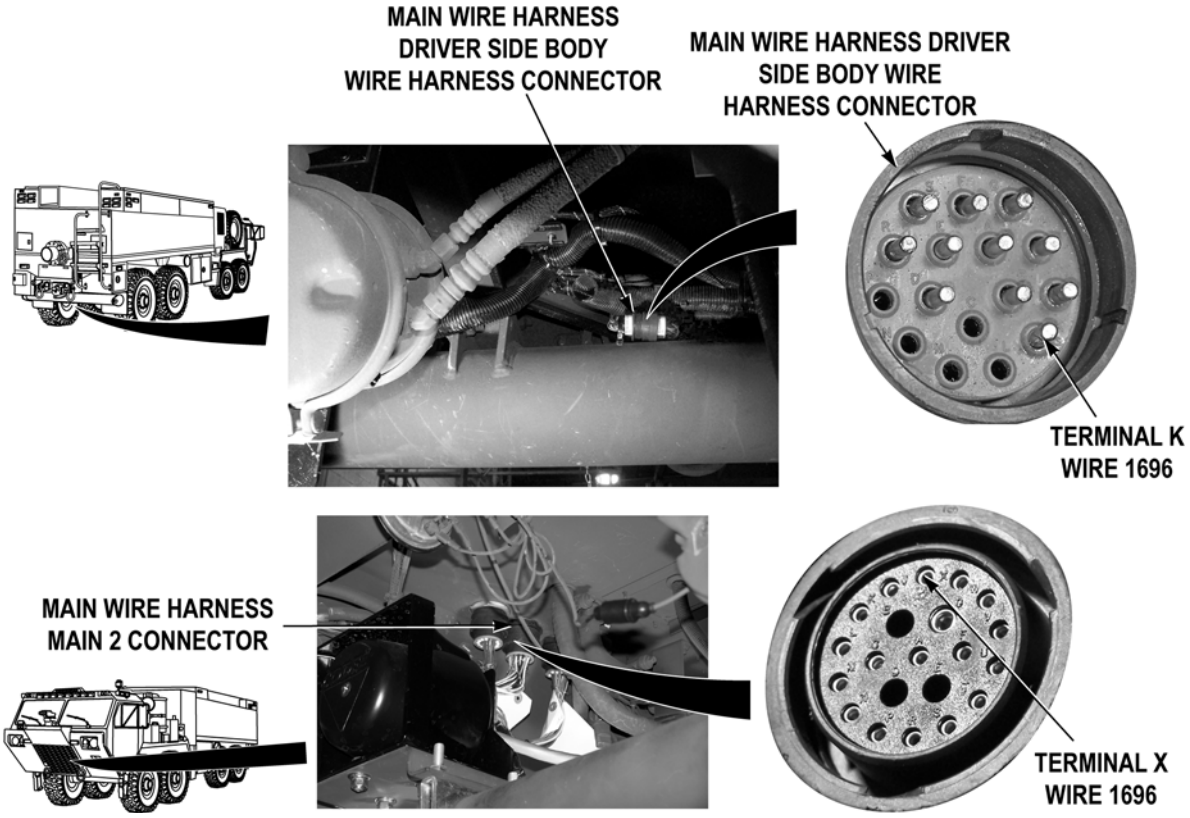
If 22 to 28 VDC are present, repair wire 1696 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).



Step 9. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across DRIVER SCENE switch, from terminal 5 to terminal 6 when switch is in on position.

If there is no continuity, replace DRIVER SCENE switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 10. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 1696 (black) from main 2 connector, terminal X to driver side body wire harness connector, terminal K.

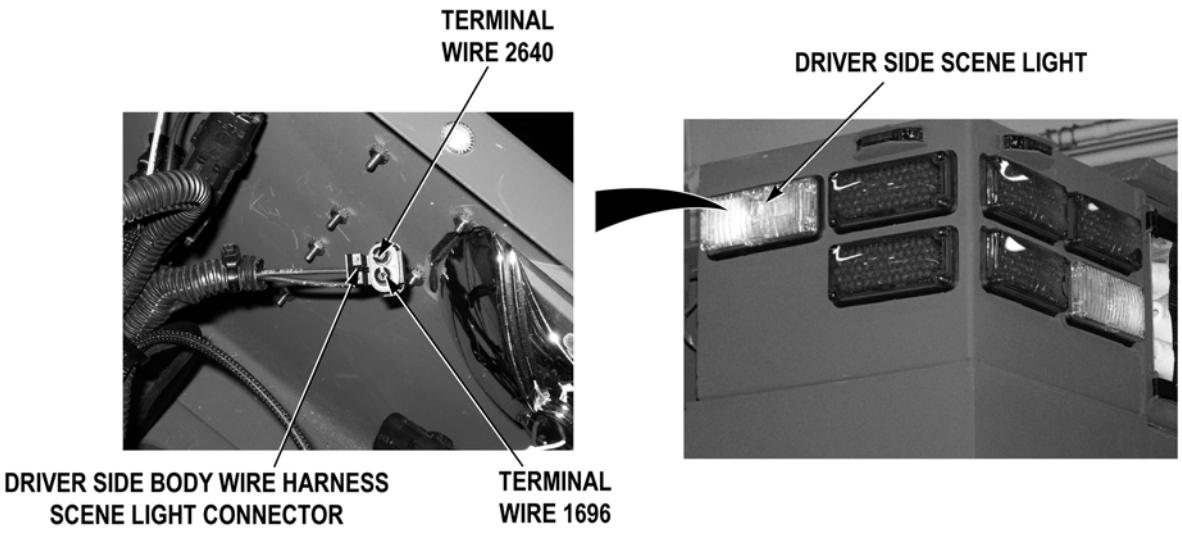
a. If there is continuity, repair wire 1696 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1696 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 11. Put DRIVER SCENE switch to off position (WP 0004). Remove driver side forward and rear light bezel covers (WP 0337). Remove both driver side scene lights (WP 0231). Swap non-operating scene light with operating scene light. Put DRIVER SCENE switch to on position (WP 0004). Check if non-operating scene light operates at new position.

If non-operating scene light does not operate, replace faulty scene light (WP 0231).



Step 12. Disconnect driver side body wire harness scene light connector. At non-operating scene light check for 22 to 28 VDC between wire 1696 (black) at non-operating driver side body wire harness scene light connector and a known good ground.

If 22 to 28 VDC are not present, repair wire 1696 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

Step 13. Put DRIVER SCENE switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect driver side body wire harness scene light connector at non-operating scene light. With a test lead set, check for continuity across wire 2640 (black) from non-operating driver side body wire harness driver side scene light connector to a known good ground.

a. If there is no continuity, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is continuity, replace non-operating driver side scene light assembly (WP 0231).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

STEP (HOSE BED) LIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0110
WP 0197
WP 0203

References (continued)
WP 0232
WP 0240
WP 0279
WP 0280
WP 0293
WP 0299

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

STEP (HOSE BED) LIGHT(S) DOES NOT OPERATE

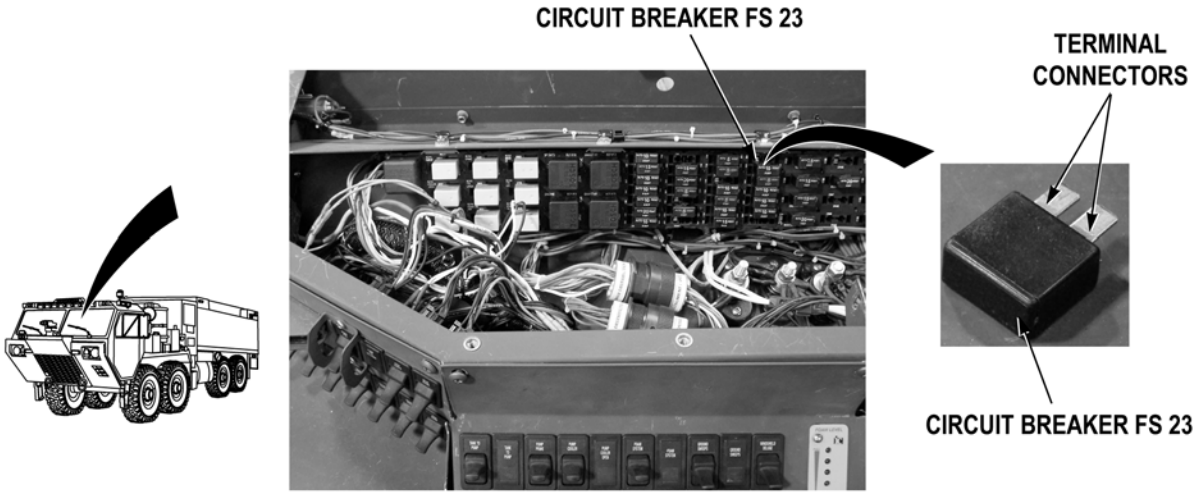
Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put STEP LIGHTS switch to on position (WP 0004). Check if at least one hose bed step light operates.

If at least one hose bed step light operates, go to Step 11.

Step 2. Push cab dome light switch to on position (WP 0004). Check if cab dome lights illuminate.

If cab dome lights do not illuminate, troubleshoot Cab Dome Lights Do Not Operate (WP 0110).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



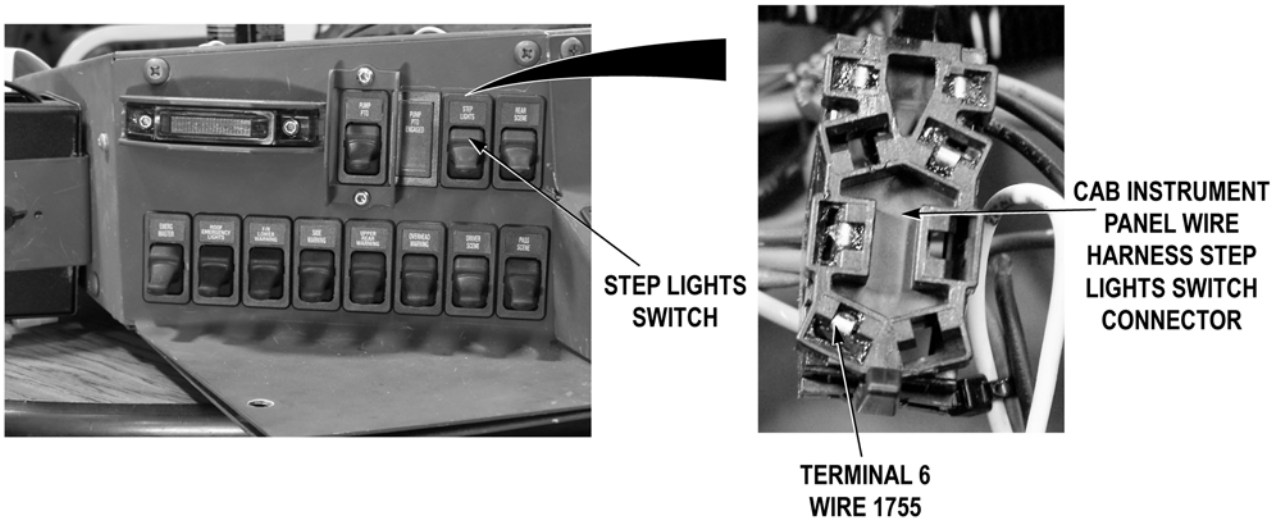
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Push cab dome light switch to off position (WP 0004). Put STEP LIGHTS switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 23 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 23 (WP 0240).

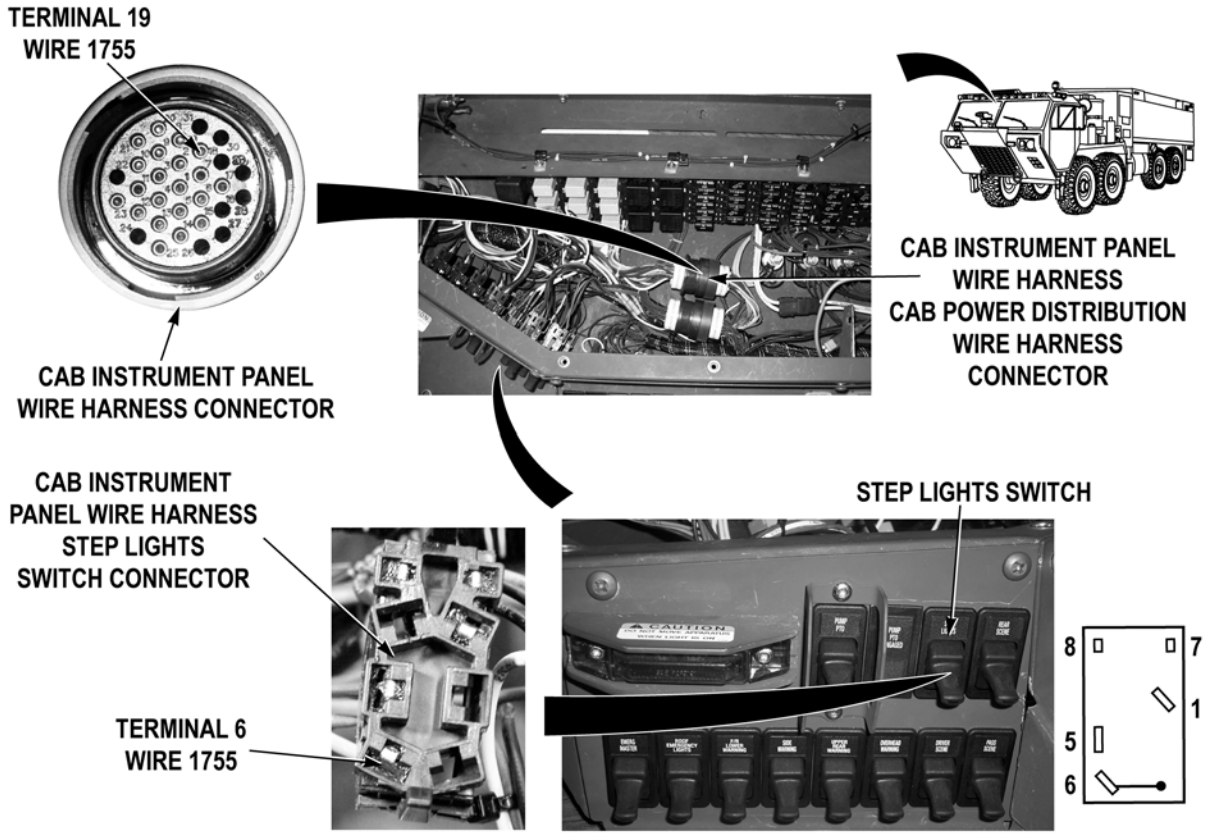
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Install circuit breaker FS 23 (WP 0240). Remove cab instrument panel C (WP 0203). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Disconnect cab instrument panel wire harness STEP LIGHTS switch connector. Check for 22 to 28 VDC between cab instrument panel wire harness wire 1755 (red) at STEP LIGHTS switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

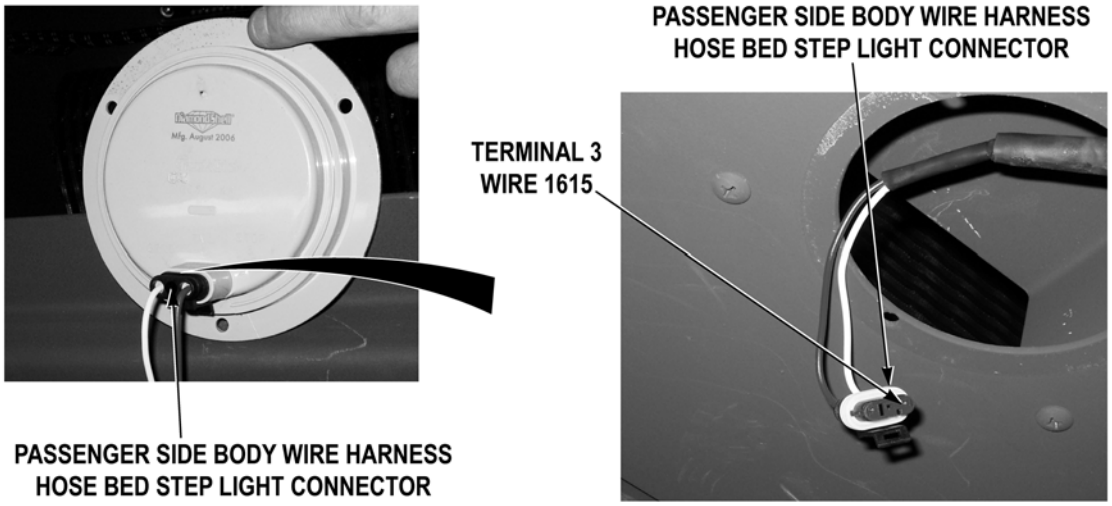


Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 1755 (red) from cab instrument panel wire harness connector, terminal 19 to STEP LIGHTS switch connector, terminal 6.

a. If there is continuity, repair wire 1755 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1755 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

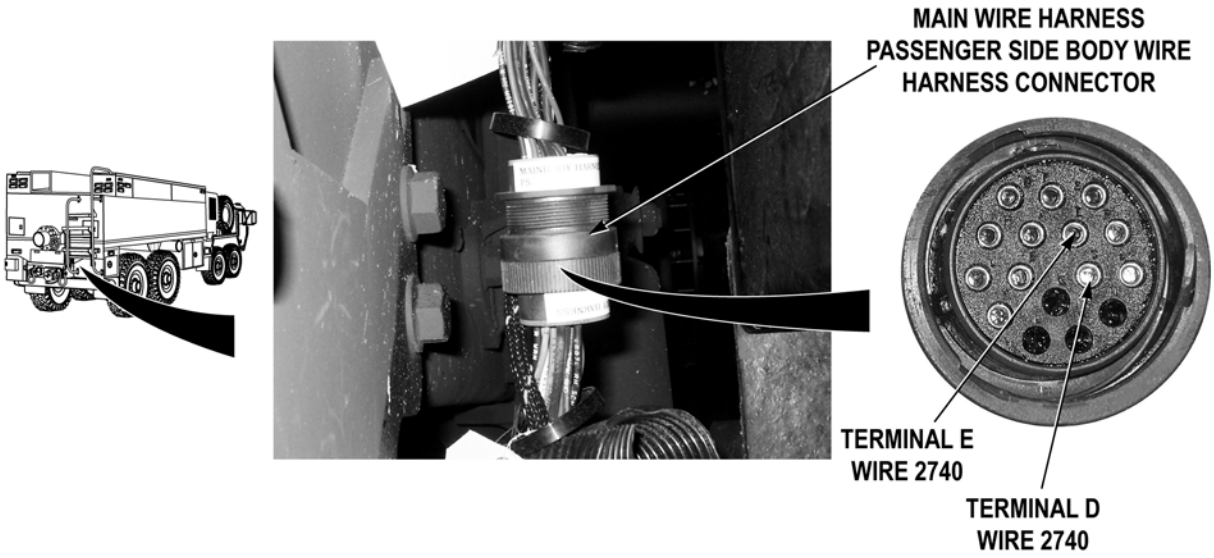
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Connect cab instrument panel wire harness STEP LIGHTS connector. Remove one hose bed step light (WP 0232). Disconnect passenger side body wire harness hose bed step light connector. Put STEP LIGHTS switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between passenger side body wire harness wire 1615 (green) at hose bed step light connector, terminal 3 and a known good ground.

If 22 to 28 VDC are not present, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Pull battery disconnect switch to off position (WP 0007). Put STEP LIGHTS switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from passenger side body wire harness connector, terminals D and E to a known good ground.

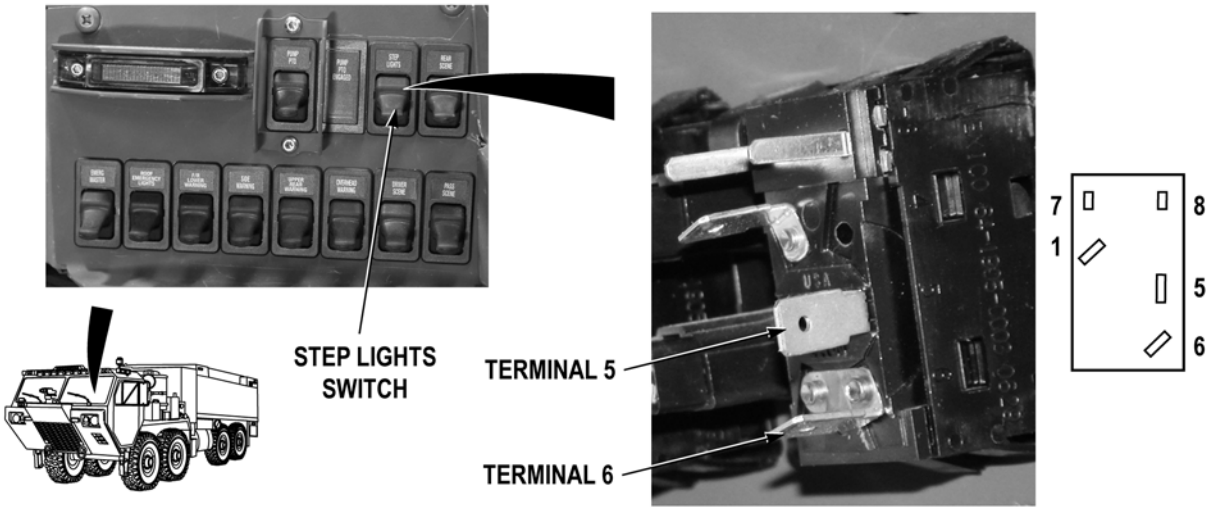
a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 8. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 1615 (green) at main wire harness passenger side body wire harness connector, terminal P and a known good ground.

If 22 to 28 VDC are present, repair wire 1615 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

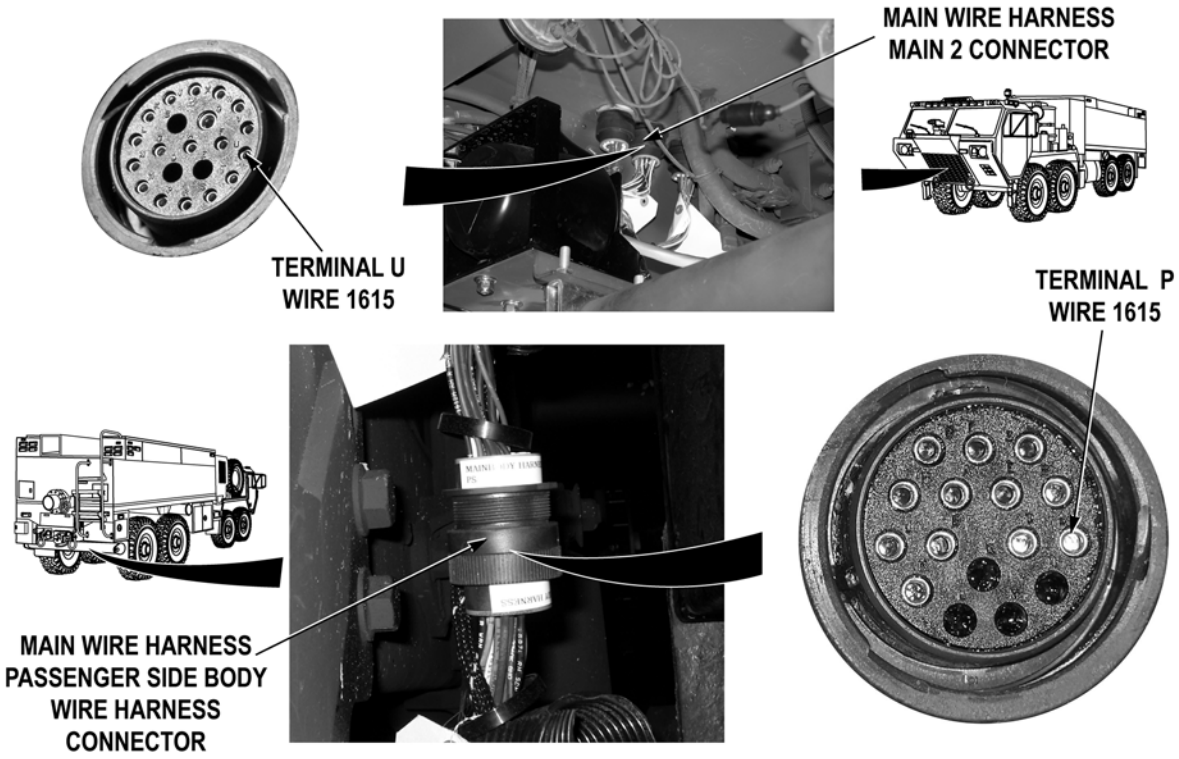
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across STEP LIGHTS switch, from terminal 5 to terminal 6, when switch is put to on position.

If there is no continuity, replace STEP LIGHTS switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

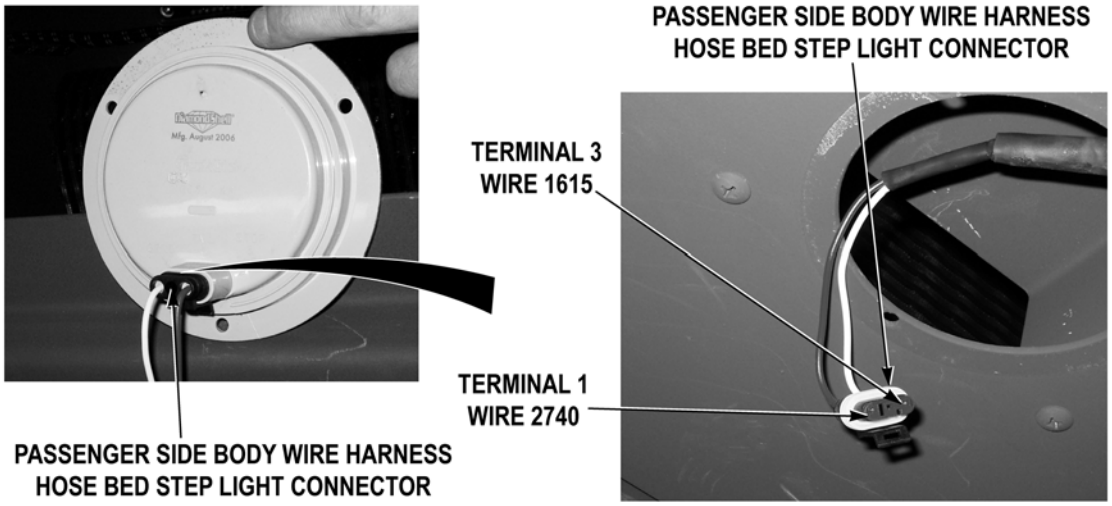


Step 10. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a lead test set, check for continuity across main wire harness wire 1615 (green) from main 2 connector, terminal U to main wire harness passenger side body wire harness connector, terminal P.

a. If there is continuity, repair wire 1615 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1615 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 11. Disconnect passenger side body wire harness hose bed step light connector at non-operating hose bed step light (WP 0232). With a test lead set, check for 22 to 28 VDC between wire 1615 (green) at passenger side body wire harness hose bed step light connector, terminal 3 and a known good ground.

If 22 to 28 VDC are not present, repair wire 1615 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

Step 12. Put STEP LIGHTS switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2740 (black) from passenger side body wire harness hose bed step light connector, terminal 1 to a known good ground.

a. If there is continuity, replace non-operating hose bed step light (WP 0232).

b. If there is no continuity, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PASSENGER SIDE SCENE LIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

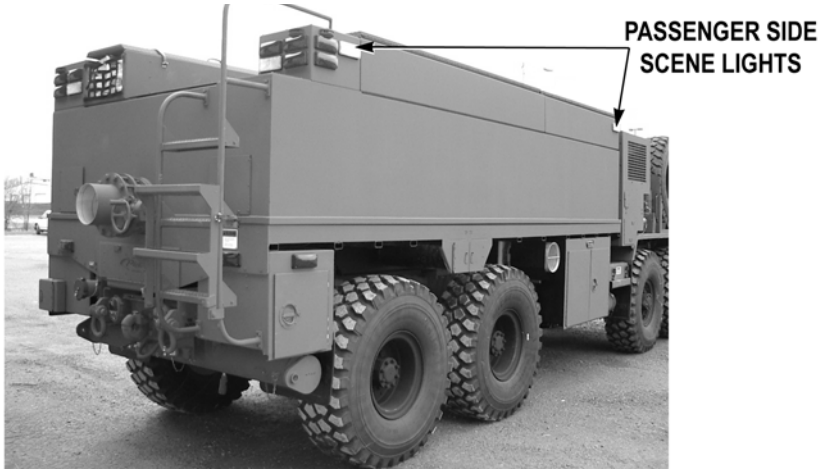
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0110
WP 0197
WP 0203
WP 0231

References (continued)
WP 0240
WP 0279
WP 0280
WP 0293
WP 0299
WP 0337

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PASSENGER SIDE SCENE LIGHT(S) DOES NOT OPERATE



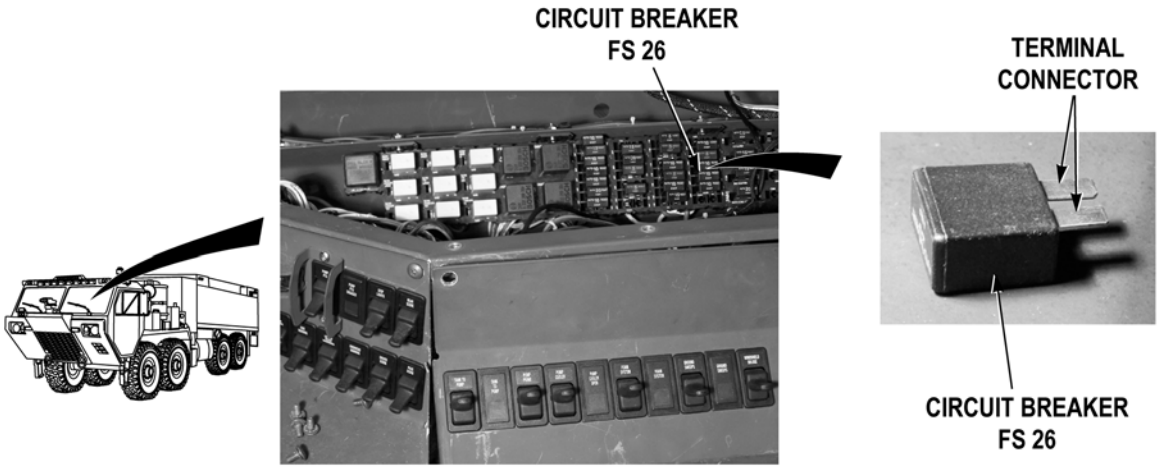
Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put PASS SCENE switch to on position (WP 0004). Check if at least one passenger side scene light operates.

If at least one passenger side scene light operates, go to Step 11.

Step 2. Push driver side and passenger side cab dome light buttons to on position (WP 0004). Check if cab dome lights operate.

If cab dome lights do not operate, troubleshoot Cab Dome Lights Do Not Operate (WP 0110).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



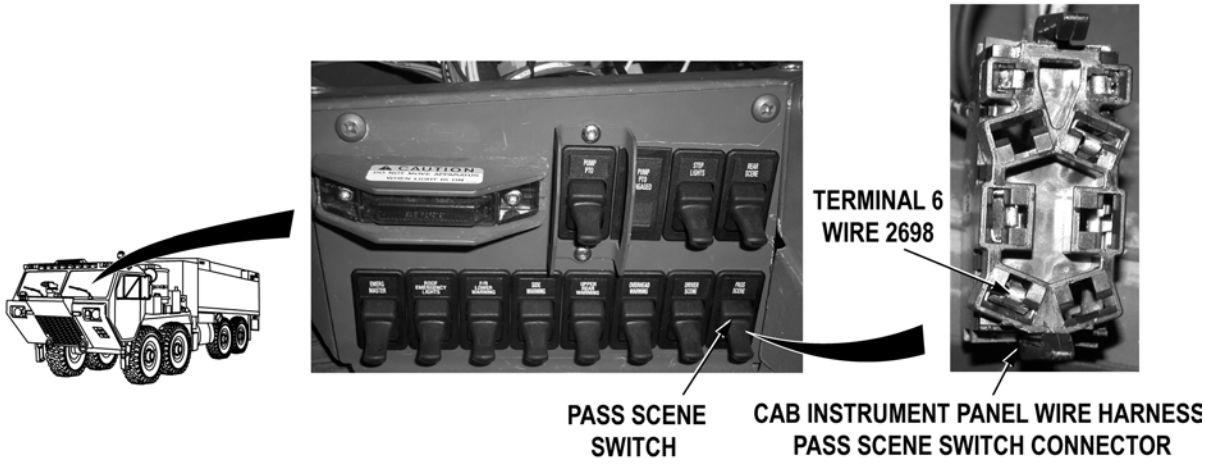
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Push driver side and passenger side cab dome light buttons to off position (WP 0004). Put PASS SCENE switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Push battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 26 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 26 (WP 0240).

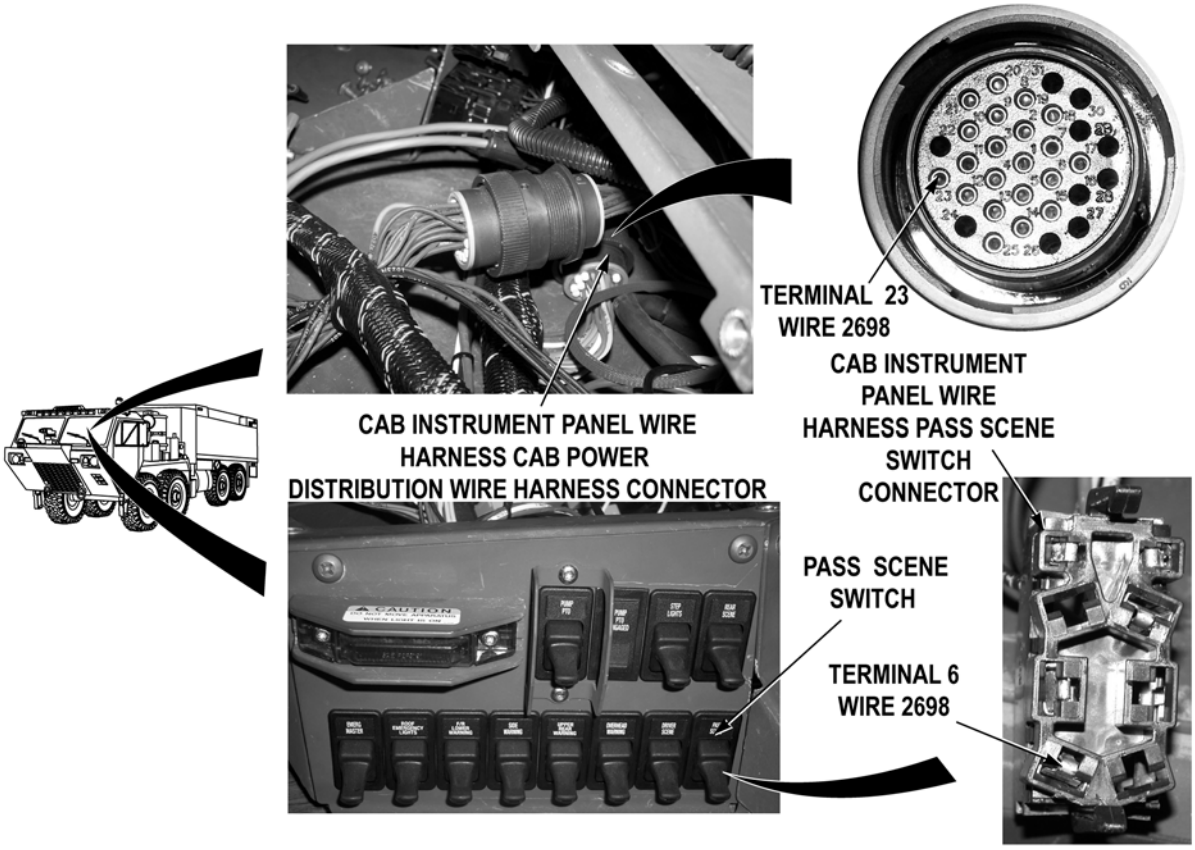
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Install circuit breaker FS 26 (WP 0240). Disconnect cab instrument panel wire harness PASS SCENE switch connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between cab instrument panel wire harness wire 2698 (violet) at PASS SCENE switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

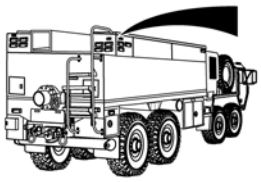


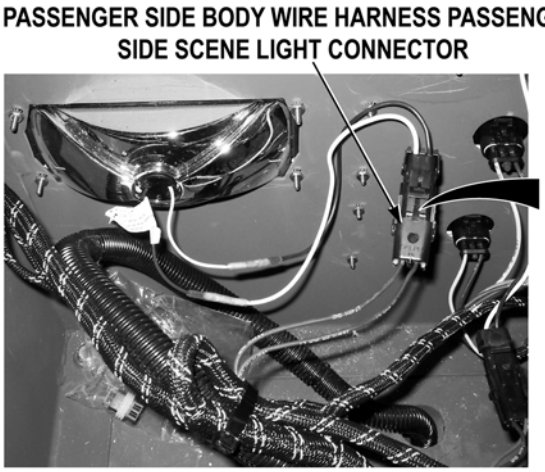
Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 2698 (violet) from cab instrument panel wire harness connector, terminal 23 to cab instrument panel wire harness PASS SCENE switch connector, terminal 6.

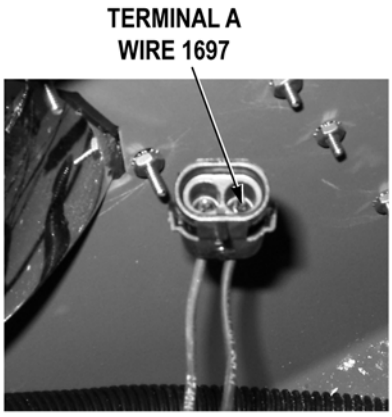
a. If there is continuity, repair wire 2698 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2698 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



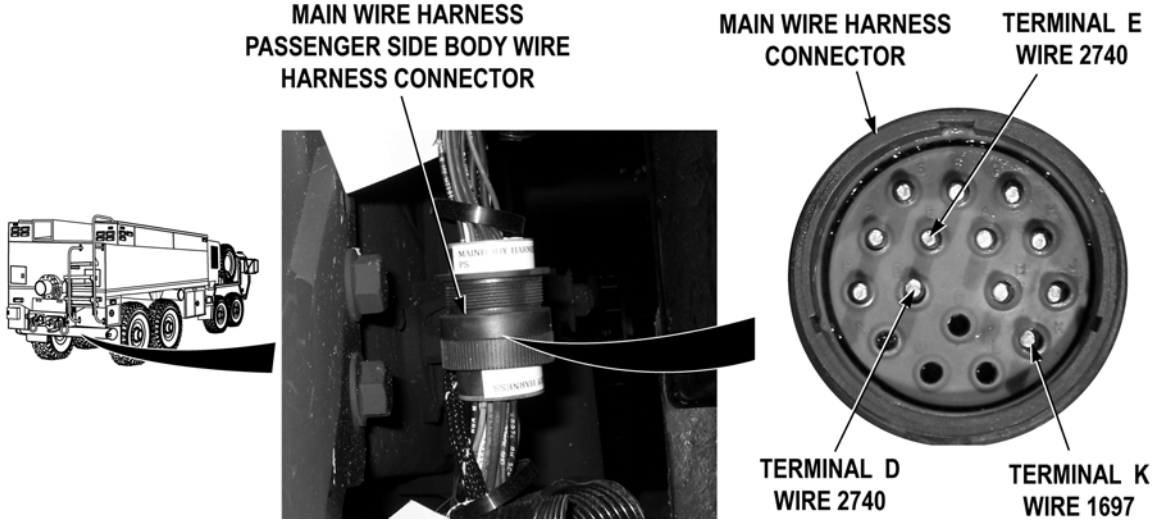




Step 6. Pull battery disconnect switch to off position (WP 0007). Connect cab instrument panel wire harness PASS SCENE switch connector. Remove passenger side light bezel cover (WP 0337). Disconnect passenger side body wire harness passenger side scene light connector. Push battery disconnect switch to on position (WP 0007). Put PASS SCENE switch to on position (WP 0004). Check for 22 to 28 VDC between passenger side body wire harness wire 1697 (black) at passenger side scene light connector, terminal A and a known good ground.

If 22 to 28 VDC are not present, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Pull battery disconnect switch to off position (WP 0007). Put PASS SCENE switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from main wire harness passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

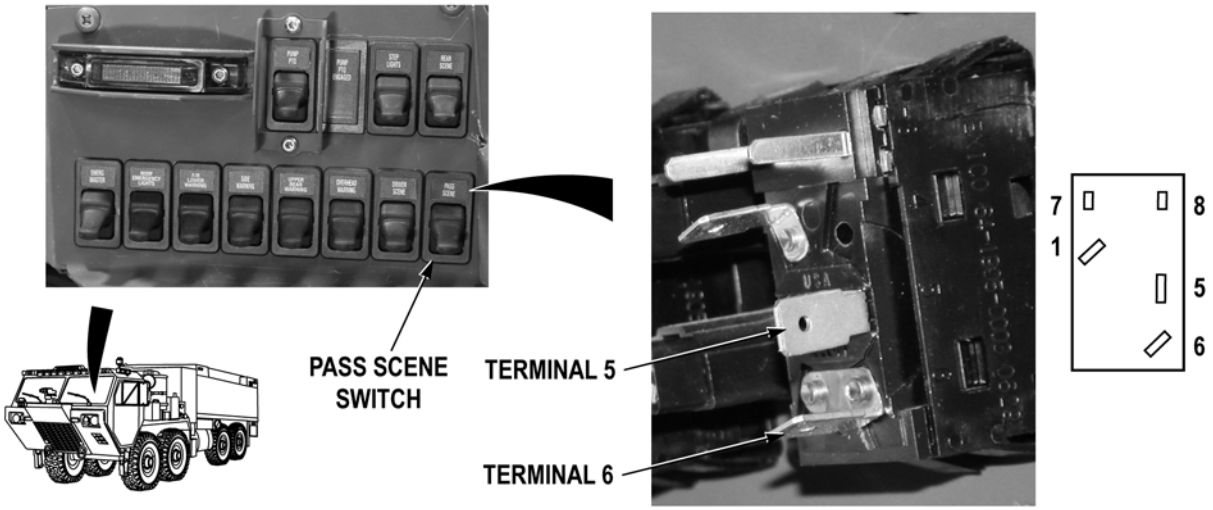
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness passenger side body wire harness connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between main wire harness wire 1697 (black) at passenger side body wire harness connector, terminal K and a known good ground.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

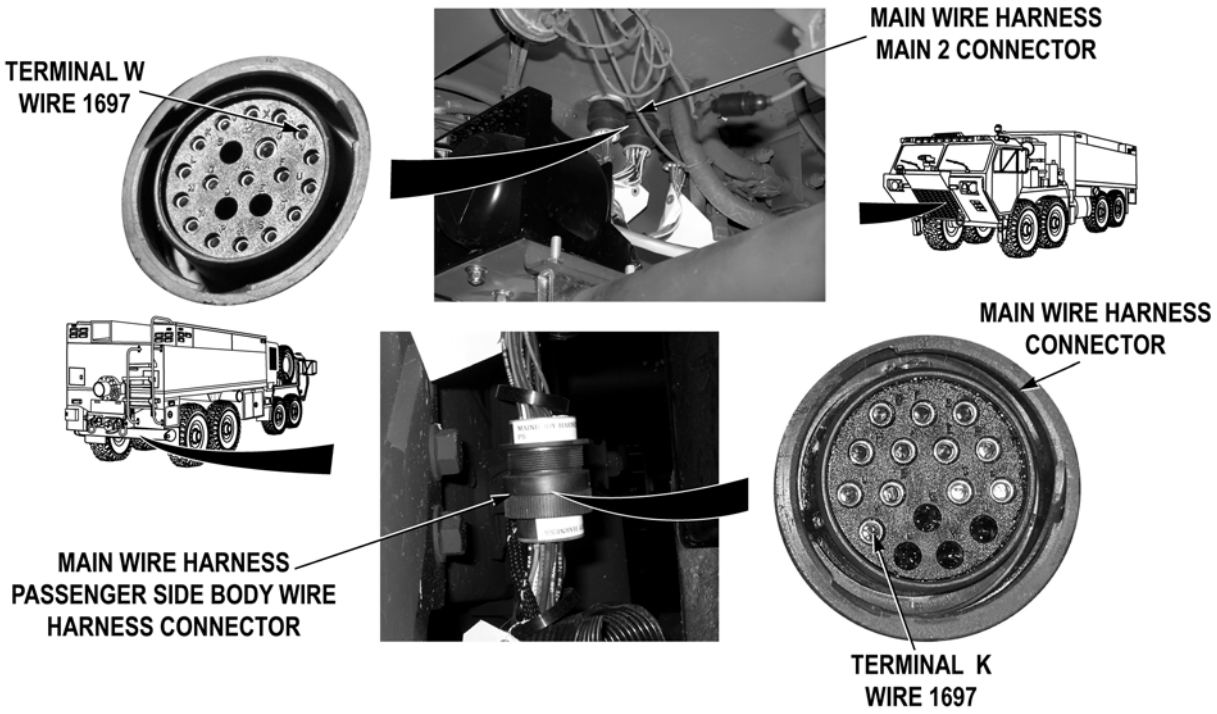
If 22 to 28 VDC are present, repair wire 1697 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).



Step 9. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Put PASS SCENE switch to on position (WP 0004). Check for continuity across PASS SCENE switch, from terminal 5 to terminal 6, when switch is in on position.

If there is no continuity, replace PASS SCENE switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across main wire harness wire 1697 (black) from main 2 connector, terminal W to main wire harness passenger side body wire harness connector, terminal K.

a. If there is continuity, repair wire 1697 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1697 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

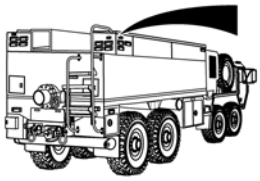
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 11. Put PASS SCENE switch to off position (WP 0004). Remove passenger side light bezel cover (WP 0337). Remove both passenger side scene lights (WP 0231). Swap non-operating scene light with operating scene light. Put PASS SCENE switch to on position (WP 0004). Check if operating scene light operates in non-operating position.

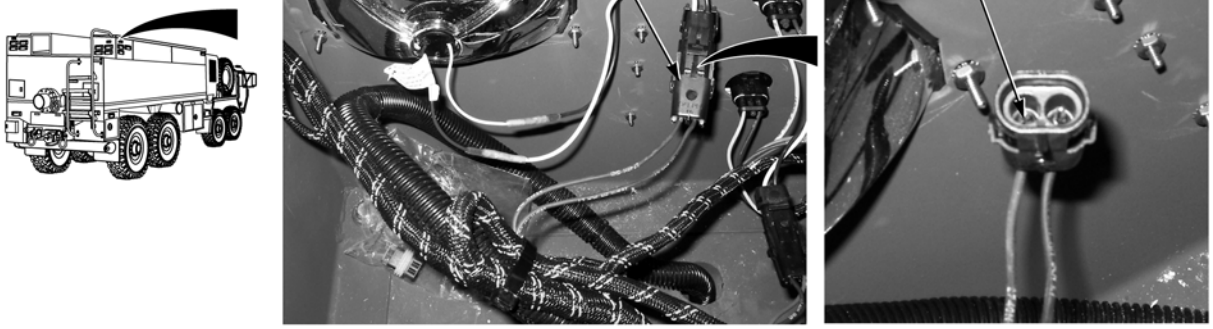
If operating scene light operates in non-operating position, replace faulty scene light (WP 0231).



Step 12. Install scene lights in original positions (WP 0231). Disconnect passenger side body wire harness connector from non-operating scene light. Check for 22 to 28 VDC between passenger side body wire harness wire 1697 (black) at passenger side body wire harness scene light connector, terminal A and a known good ground.

If 22 to 28 VDC are not present, repair wire 1697 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Put PASS SCENE switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Push battery disconnect switch to off position (WP 0007). Check for continuity across passenger side body wire harness wire 2740 (black) from passenger side body wire harness scene light connector to a known good ground.

a. If there is no continuity, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body harness (WP 0299).

b. If there is continuity, replace non-operating passenger side scene light (WP 0231).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

REAR SCENE LIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0110
WP 0197
WP 0203
WP 0231
WP 0240

References (continued)
WP 0279
WP 0280
WP 0287
WP 0293
WP 0299
WP 0337

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

REAR SCENE LIGHT(S) DOES NOT OPERATE

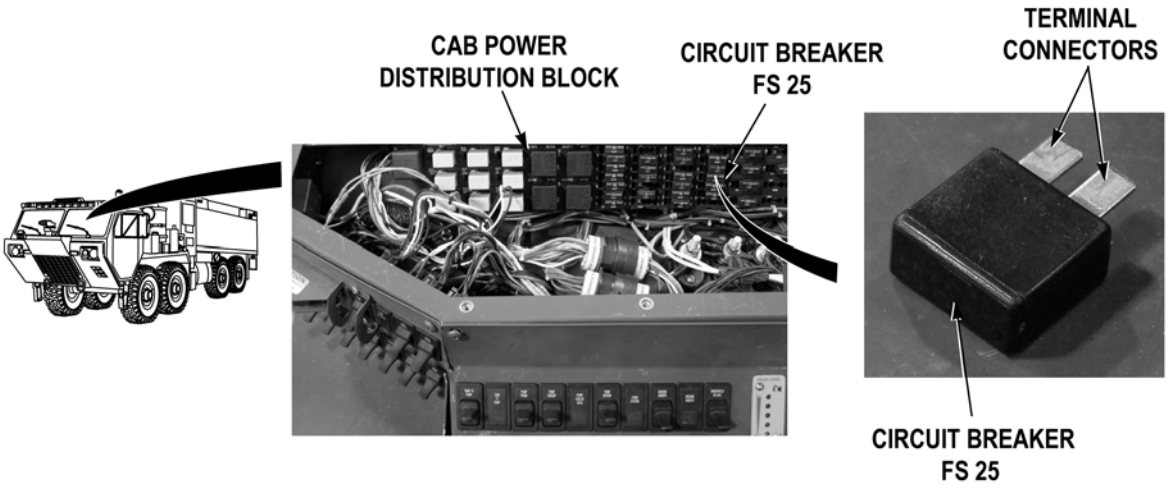
Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Put REAR SCENE switch to on position (WP 0004). Check if at least one rear scene light operates.

If at least one rear scene light operates, go to Step 8.

Step 2. Push cab dome light switch to on position (WP 0004). Check if cab dome lights operate.

If cab dome lights do not operate, troubleshoot Cab Dome Light(s) Does Not Operate (WP 0110).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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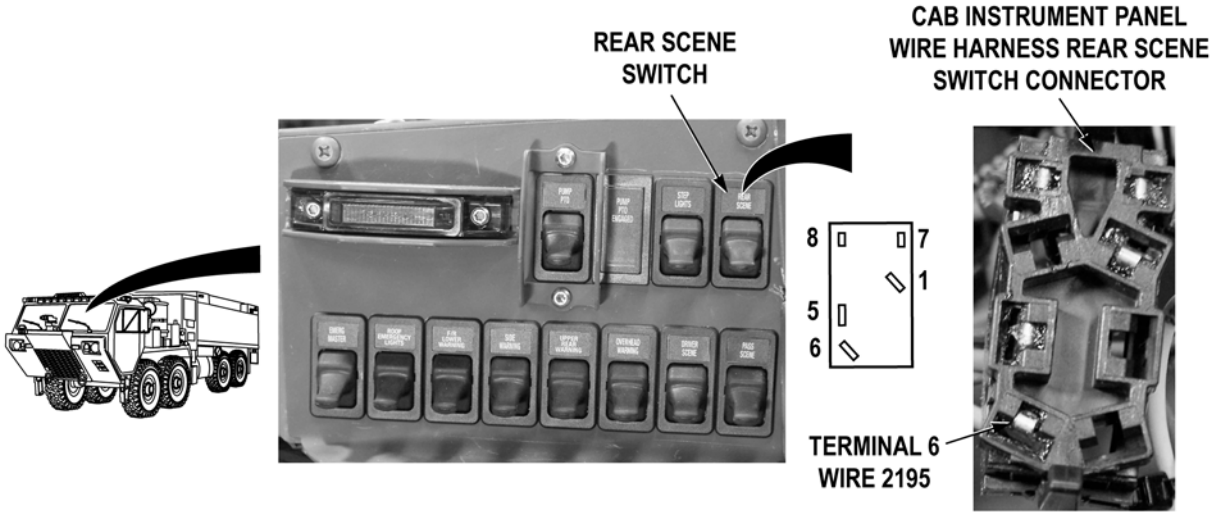
Step 3. Push cab dome lights switch to off position (WP 0004). Put REAR SCENE switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 25 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 25 (WP 0240).

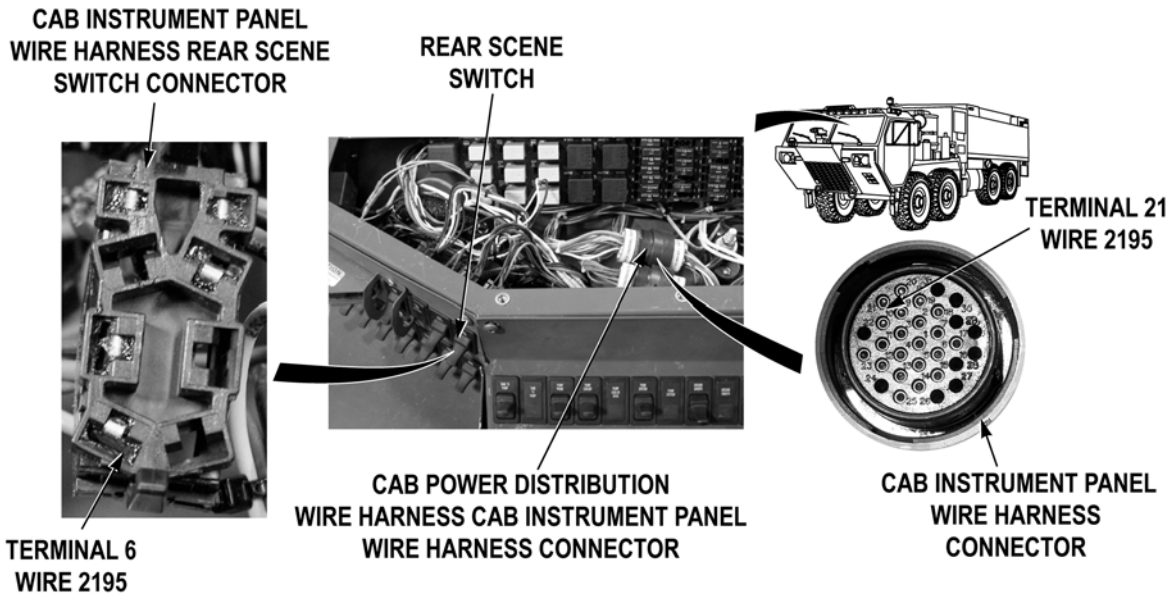
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Install circuit breaker FS 25 (WP 0240). Push battery disconnect switch to on position (WP 0007). Remove cab instrument panel C (WP 0203). Disconnect cab instrument panel wire harness REAR SCENE switch connector. Check for 22 to 28 VDC between cab instrument panel wire harness wire 2195 (orange) at cab instrument panel wire harness REAR SCENE switch connector, terminal 6 and a known good ground.

If 22 to 28 VDC are present, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

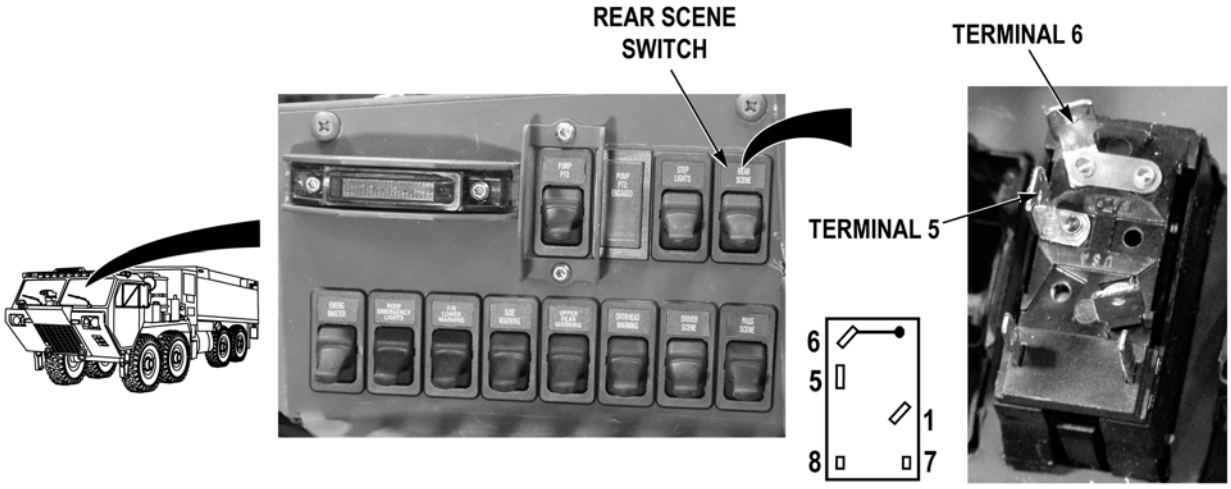


Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect cab power distribution wire harness cab instrument panel wire harness connector. With a test lead set, check for continuity across cab instrument panel wire harness wire 2195 (orange) from cab instrument panel wire harness connector, terminal 21 to cab instrument panel wire harness REAR SCENE switch connector, terminal 6.

a. If there is continuity, repair wire 2195 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2195 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

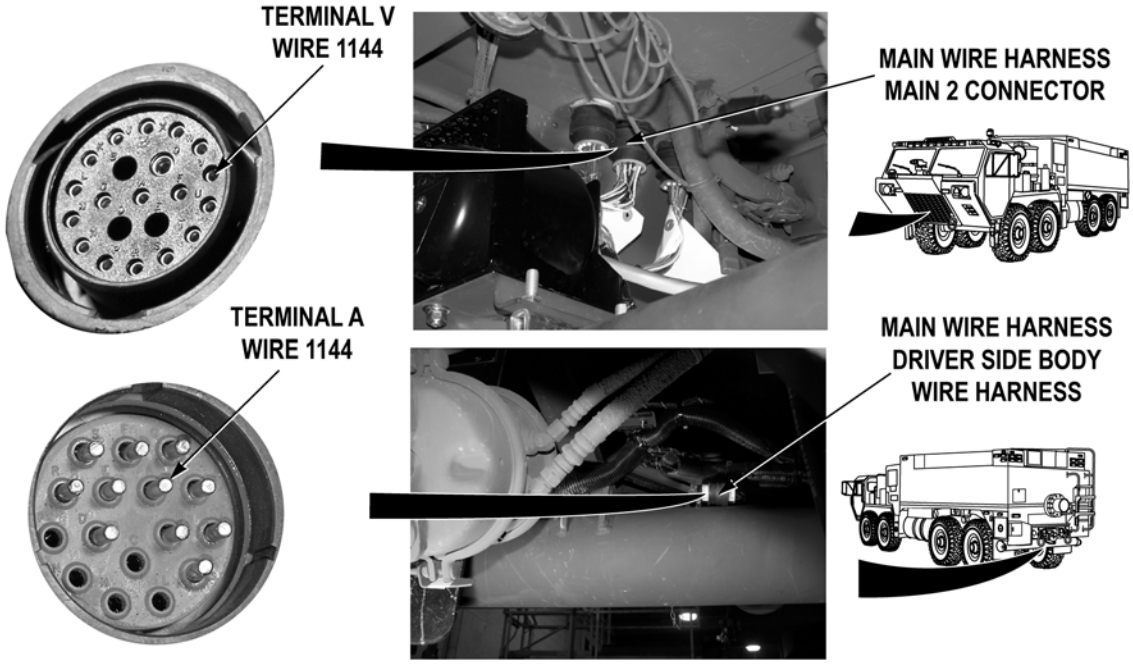
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across REAR SCENE switch, from terminal 5 to terminal 6, when switch is in on position.

If there is no continuity, replace REAR SCENE switch (WP 0197).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Driver side and passenger side body harness checked same way. Driver side body wire harness shown.

Step 7. Remove skid plate grille (WP 0350). Disconnect main wire harness main 2 connector. Disconnect main wire harness from either driver side body or passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 1144 (blue) from main 2 connector, terminal V to driver side body or passenger side body wire harness connector, terminal A.

a. If there is continuity, repair wire 1144 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

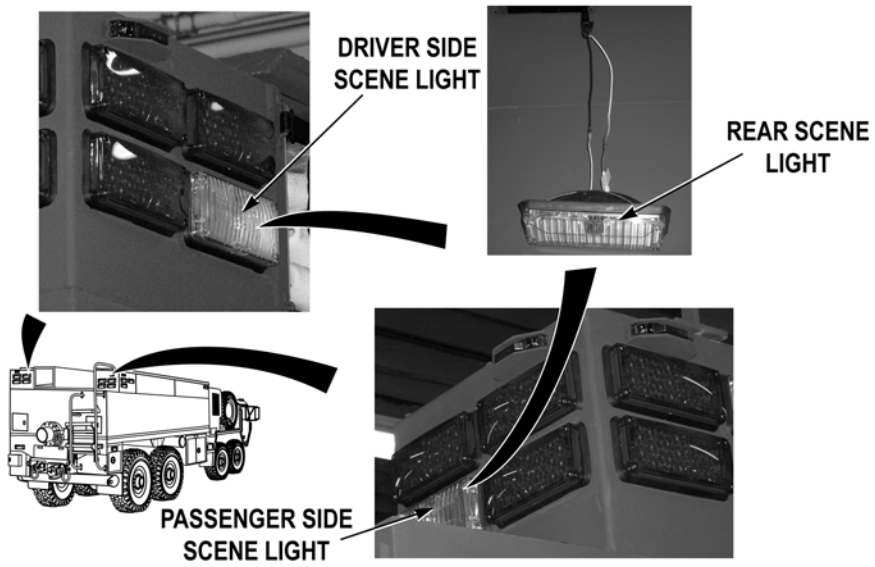
b. If there is no continuity, repair wire 1144 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 8. Check if driver side rear scene light is operating.

If driver side rear scene light is not operating, go to Step 14.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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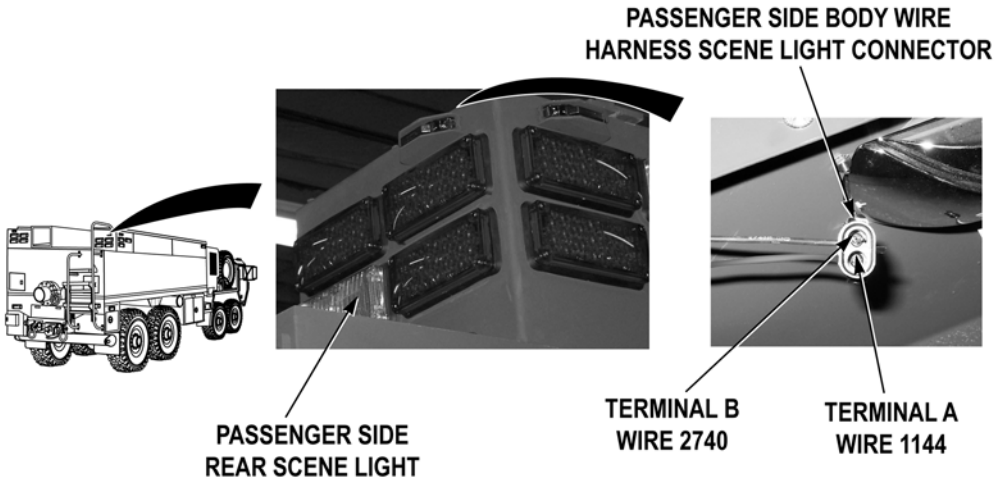
Step 9. Put REAR SCENE switch to off position (WP 0004). Remove passenger side light bezel cover (WP 0337). Remove driver side rear light bezel cover (WP 0337). Remove both rear scene lights (WP 0231). Swap passenger side rear scene light with driver side rear scene light. Put REAR SCENE switch to on position (WP 0004). Check if passenger side rear scene light operates in new position.

If passenger side rear scene light operates, replace faulty driver side rear scene light (WP 0231).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



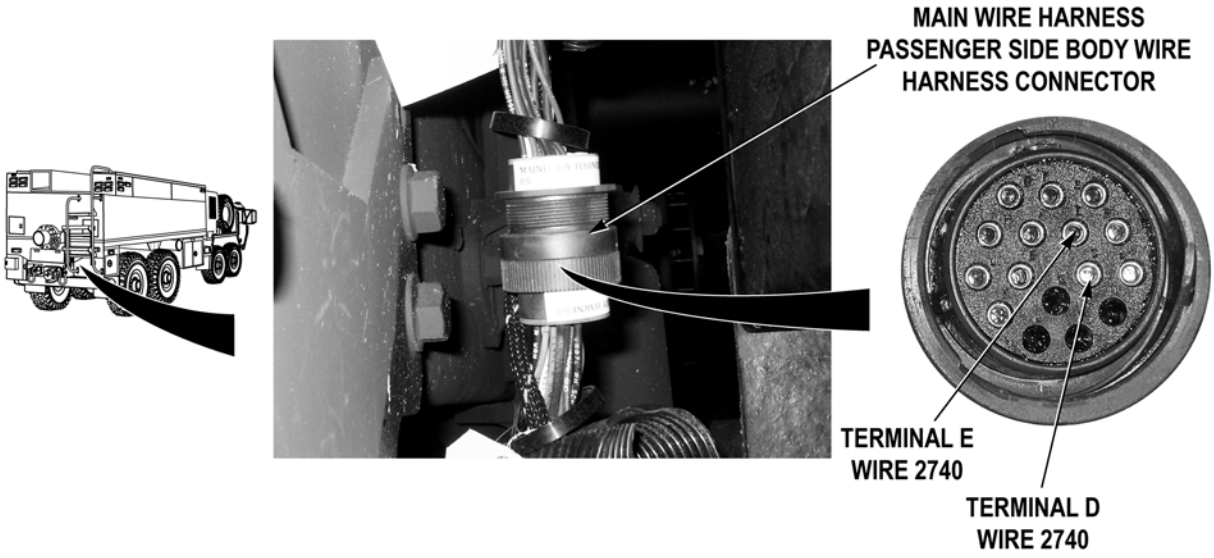
Step 10. Re-install scene lights to original positions (WP 0231). Disconnect passenger side body wire harness rear scene light connector. Check for 22 to 28 VDC between passenger side body wire harness wire 1144 (blue) at scene light connector, terminal A and a known good ground.

If 22 to 28 VDC are not present, go to Step 13.

Step 11. Put REAR SCENE switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across wire 2740 (black) from passenger side body wire harness rear scene light connector, terminal B to a known good ground.

If there is continuity, replace passenger side rear scene light (WP 0231).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 12. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from main wire harness passenger side body harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

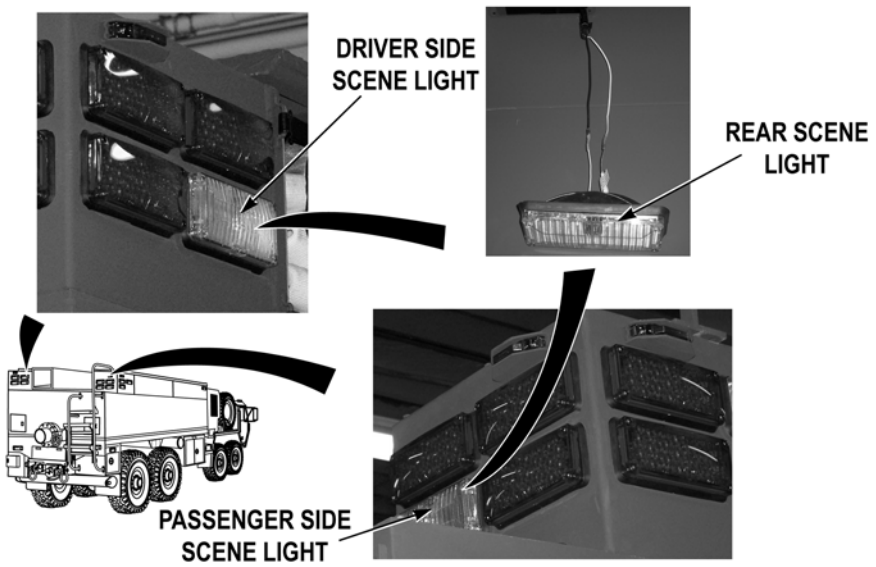
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 13. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 1144 (blue) from main wire harness passenger side body wire harness connector, terminal A to a known good ground.

a. If 22 to 28 VDC are present, repair wire 1144 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If 22 to 28 VDC are not present, repair wire 1144 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

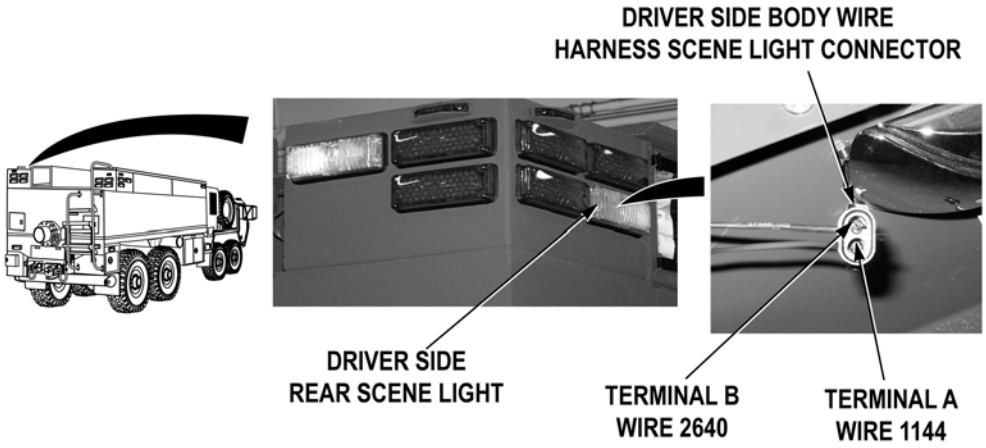
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Put REAR SCENE switch to off position (WP 0337). Remove passenger side light bezel cover (WP 0337). Remove driver side light bezel cover (WP 0337). Remove both rear scene lights (WP 0231). Swap driver side rear scene light with passenger side rear scene light. Put REAR SCENE switch to on position (WP 0004). Check if passenger side rear scene light operates in new position.

If passenger side rear scene light operates, replace faulty driver side scene light (WP 0231).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



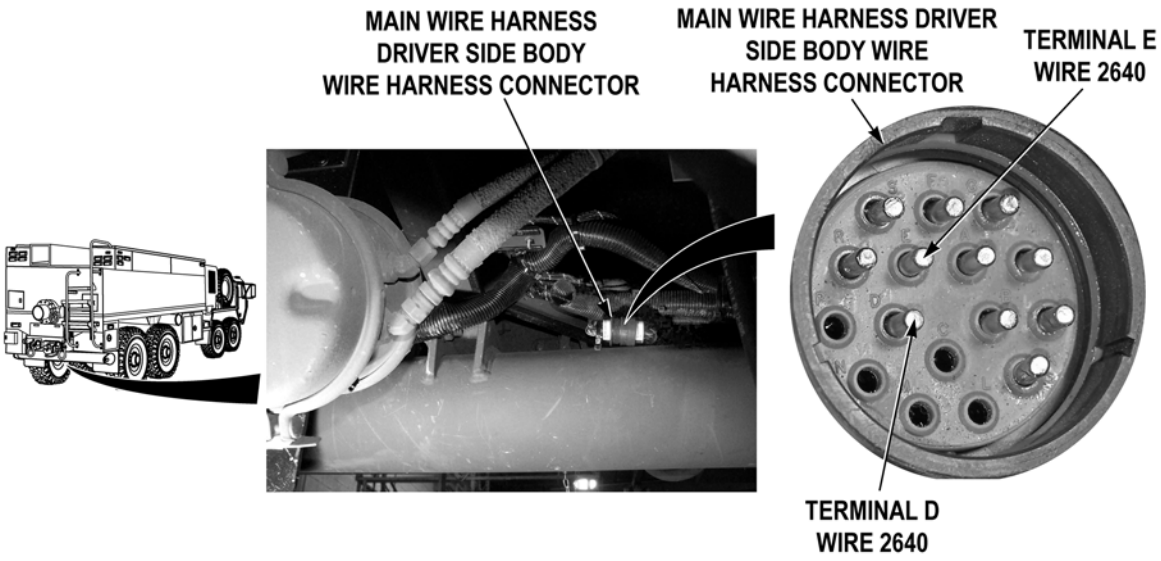
Step 15. Re-install scene light to original positions (WP 0231). Disconnect driver side body wire harness rear scene light connector. Check for 22 to 28 VDC between driver side body wire harness wire 1144 (blue) at scene light connector terminal A and a known good ground.

If 22 to 28 VDC are not present, go to Step 18.

Step 16. Put REAR SCENE switch to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Check for continuity across wire 2640 (black) from driver side body wire harness rear scene light connector, terminal B and a known good ground.

If there is continuity, replace driver side rear scene light (WP 0231).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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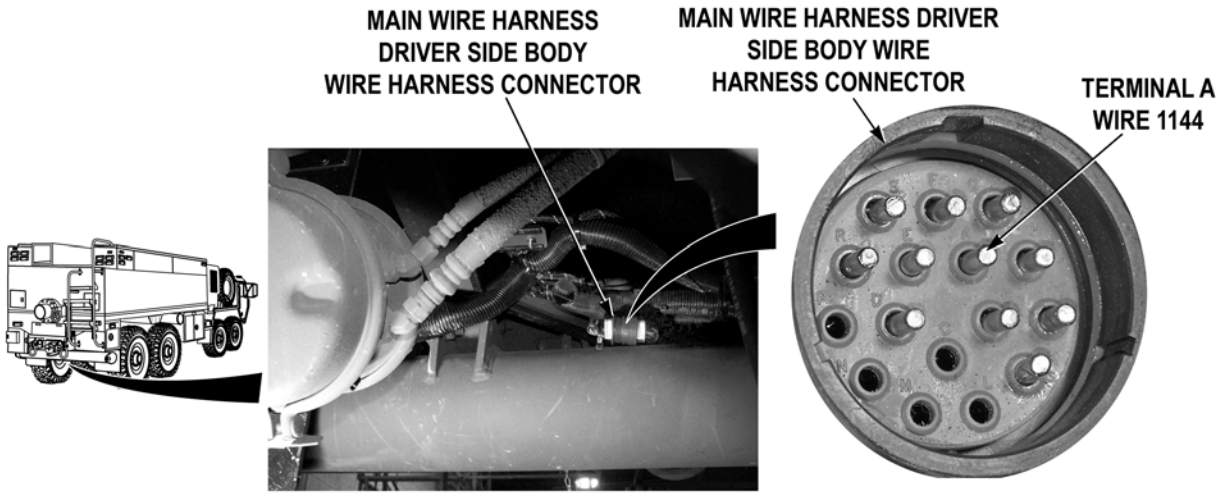
Step 17. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2640 (black) from driver side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 18. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 1144 (blue) from driver side body wire harness connector, terminals A to a known good ground.

a. If 22 to 28 VDC are present, repair wire 1144 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If 22 to 28 VDC are not present, repair wire 1144 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

CAB DOME LIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0202
WP 0203
WP 0233

References (continued)
WP 0240
WP 0273
WP 0279
WP 0280
WP 0282

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

CAB DOME LIGHT(S) DOES NOT OPERATE

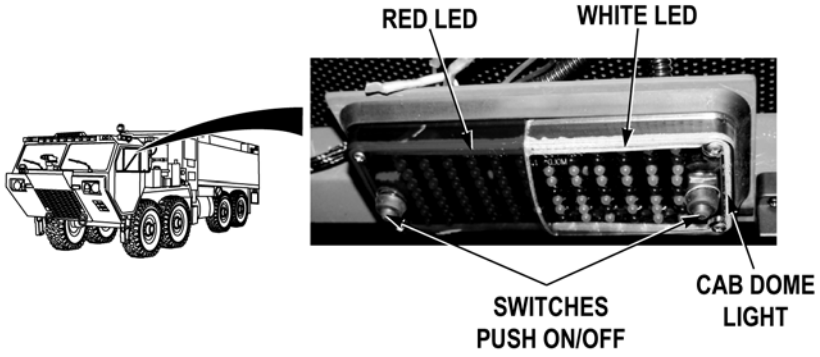
NOTE

This procedure troubleshoots HEWATT specific cab dome lights. If non-operating cab dome light is located at rear of HEMTT cab, troubleshoot Dome Light Does Not Operate (TM 9-2320-315-14&P).

Step 1. Push battery disconnect switch to on position (WP 0007). Check if service drive lights are on (not in blackout mode) (TM 9-2320-279-10).

If service drive lights are not on, Turn Service Drive Lights On (TM 9-2320-279-10).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Push driver side red and white LED cab dome light switches to on position (WP 0004). Check if either driver side red or white LED cab dome light illuminates.

If either driver side red or white LED cab dome light does not illuminate, go to Step 5.

Step 3. Check if only red or white LED of driver side cab dome light illuminates.

If only red or white LED driver side cab dome light illuminates, replace driver side cab dome light (WP 0233).

Step 4. Push passenger side red and white LED cab dome light switches to on position (WP 0004). Check if red or white LED of passenger side cab dome lights illuminate.

a. If only red or white LED passenger side cab dome light illuminates, replace passenger side cab dome light (WP 0233).

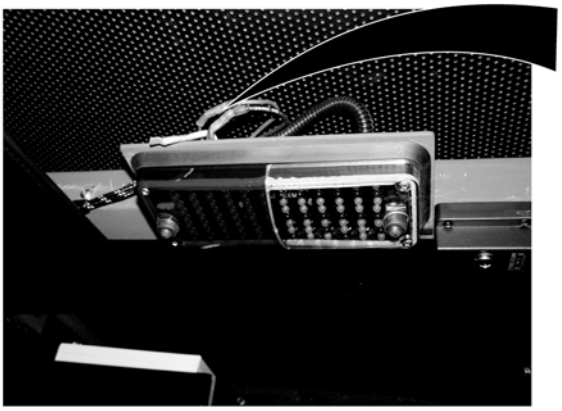
b. If passenger side cab dome does not illuminate, go to Step 6.

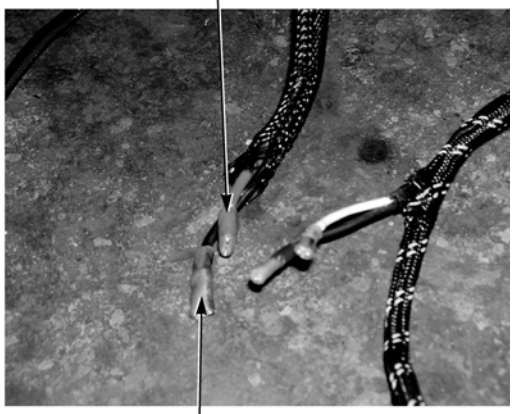
Step 5. Push passenger side red and white LED cab dome light switches to on position (WP 0004). Check if passenger side cab dome light illuminates.

a. If only red or white LED passenger side cab dome light illuminates, replace passenger side cab dome light (WP 0233).

b. If passenger side cab dome light does not illuminate, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 6. Cut cab roof wire harness cab dome light butt splice connector wire 1047 (red) at non-operating cab dome light. Check for 22 to 28 VDC between cab roof wire harness wire 1047 (red) at non-operating cab dome light termination and a known good ground.

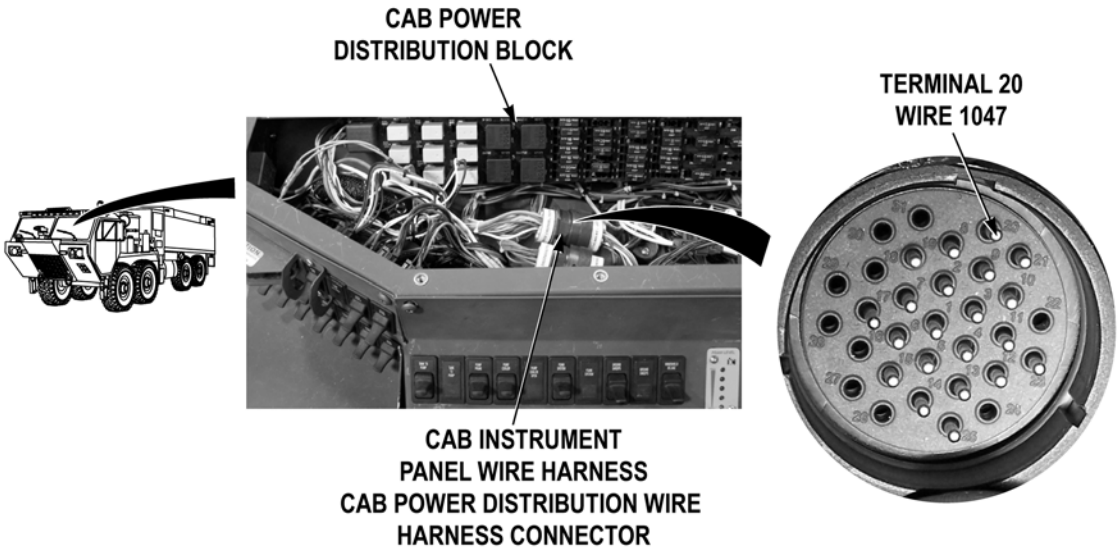
If 22 to 28 VDC are not present, repair wire 1047 in cab roof wire harness if repairable (TM 9-2320-315-14&P), or replace cab roof wire harness (WP 0282).

Step 7. Pull battery disconnect switch to off position (WP 0007). Cut cab roof wire harness cab dome light butt splice connector wire 2640 (black) at non-operating cab dome light. Check for continuity across wire 2640 (black) from cab roof wire harness non-operating cab dome light termination and a known good ground.

a. If there is continuity, replace cab dome light (WP 0233).

b. If there is no continuity, repair wire 2640 in cab roof wire harness if repairable (TM 9-2320-315-14&P), or replace cab roof wire harness (WP 0282).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



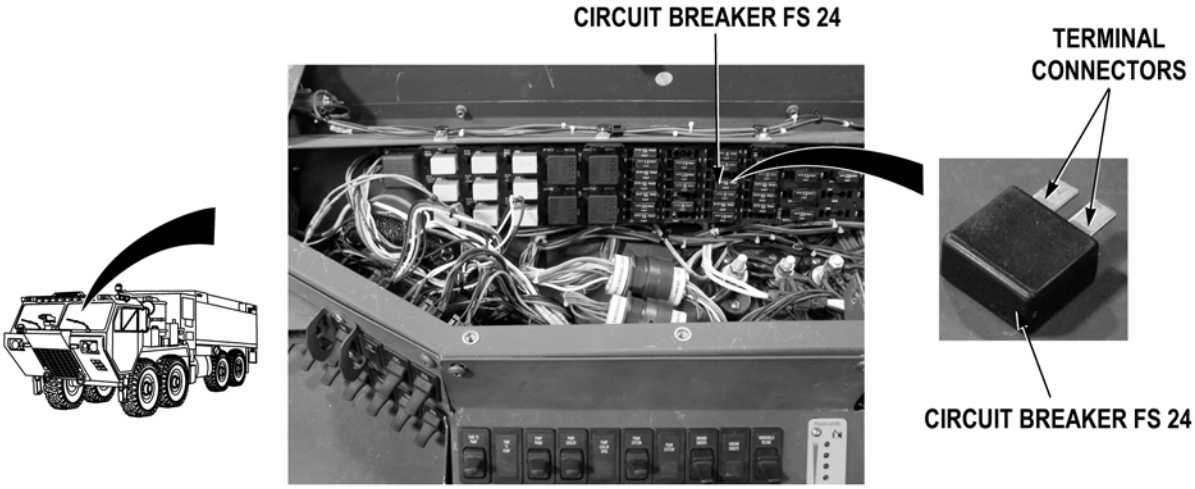
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Remove cab instrument panel A (WP 0203). Disconnect cab instrument panel wire harness cab power distribution wire harness connector. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 1047 (red) at cab instrument panel wire harness cab power distribution wire harness connector, terminal 20 and a known good ground.

If 22 to 28 VDC are present, go to Step 10.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

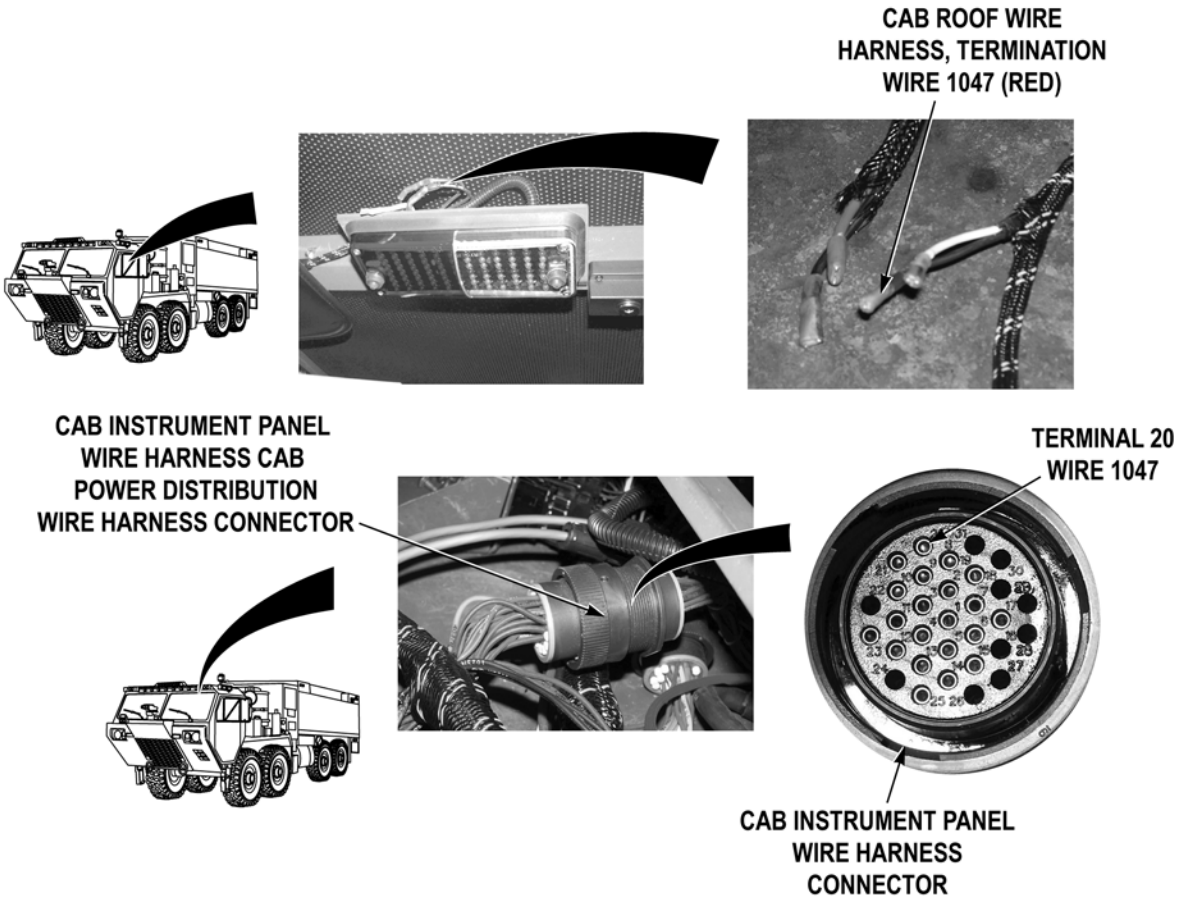


Step 9. Pull battery disconnect switch to off position (WP 0007). Reconnect cab instrument panel wire harness cab power distribution wire harness connector. Remove circuit breaker FS 24 from cab power distribution block (WP 0240). Check for continuity across circuit breaker.

a. If there is continuity, repair wire 1047 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, replace circuit breaker FS 24 (WP 0240).

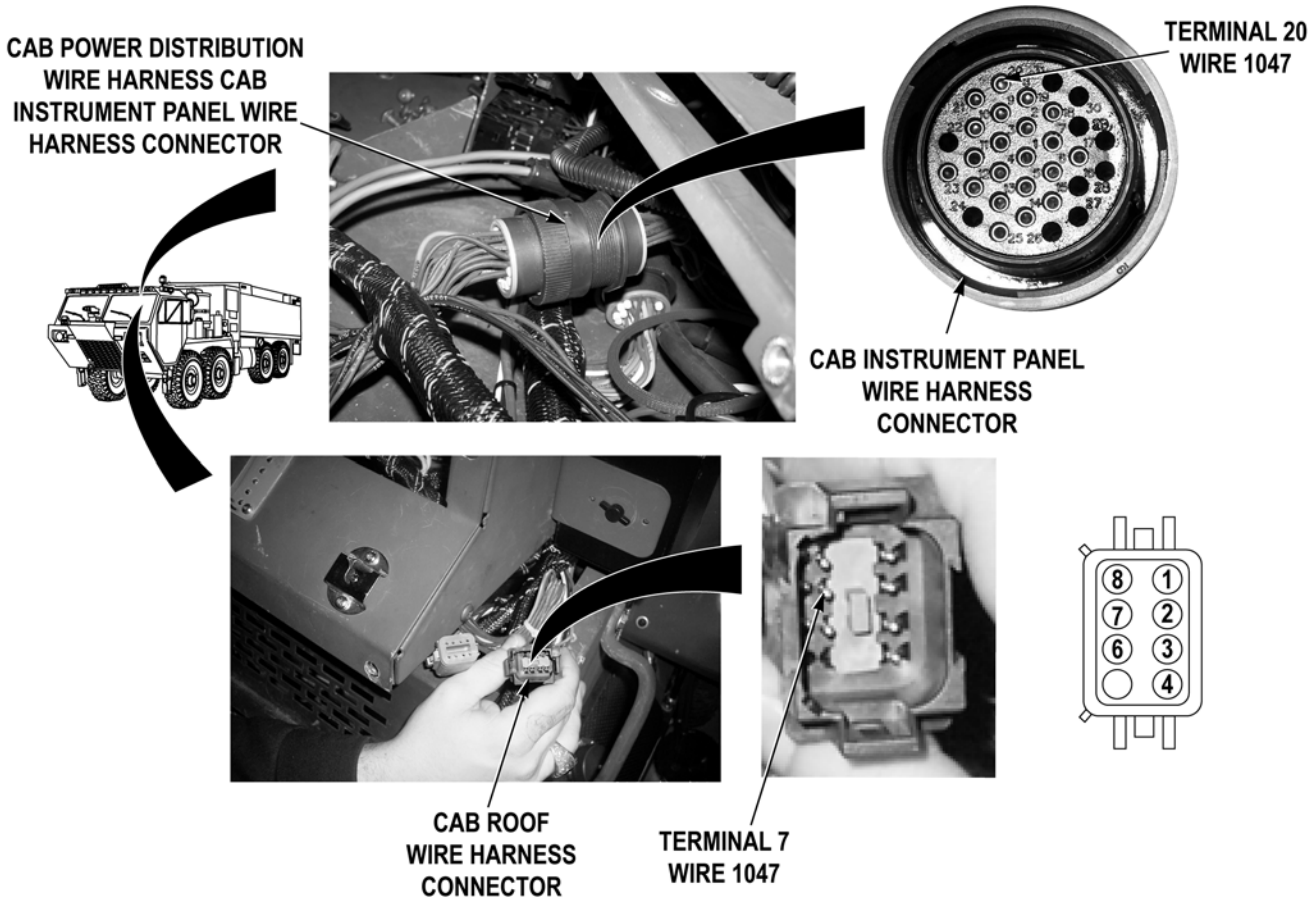
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Pull battery disconnect switch to off position (WP 0007). Cut cab roof wire harness cab dome light butt splice connector wire 1047 (red) at driver side cab dome light. With a test lead set, check for continuity across wire 1047 (red) from cab roof wire harness cab dome light termination to cab instrument panel wire harness, terminal 20.

If there is continuity, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

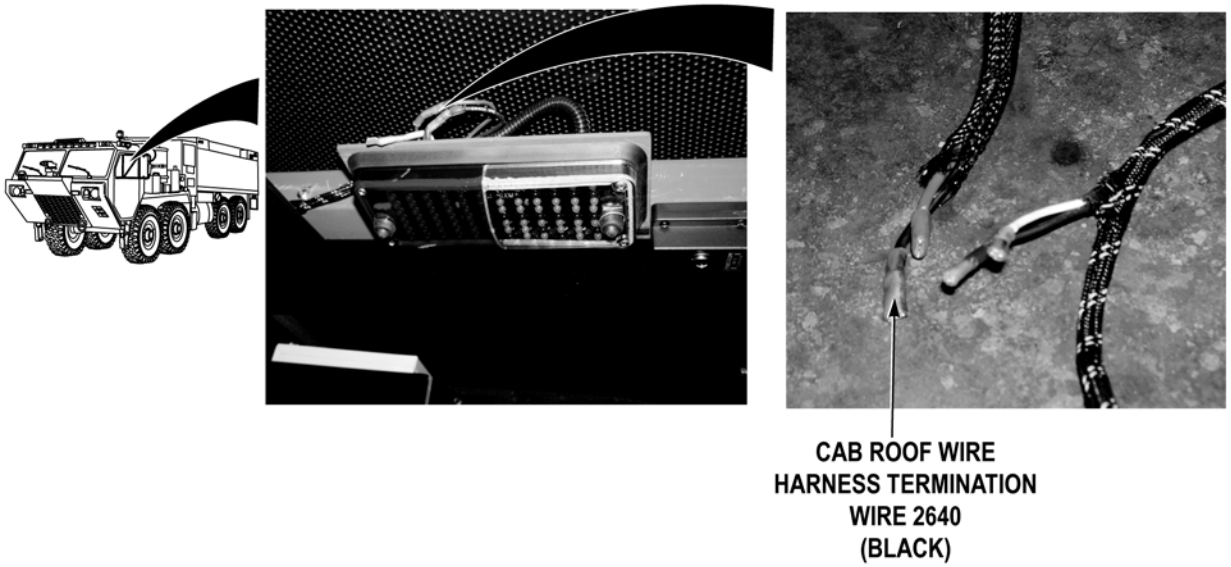


Step 11. Remove cab instrument panel assembly (WP 0202). Disconnect cab instrument panel wire harness cab roof wire harness connector. With a test lead set, check for continuity across cab instrument wire harness wire 1047 (red) from cab instrument panel wire harness cab power distribution wire harness connector, terminal 20 to cab instrument panel wire harness cab roof wire harness connector, terminal 7.

a. If there is continuity, repair wire 1047 in cab roof wire harness if repairable (TM 9-2320-315-14&P), or replace cab roof wire harness (WP 0282).

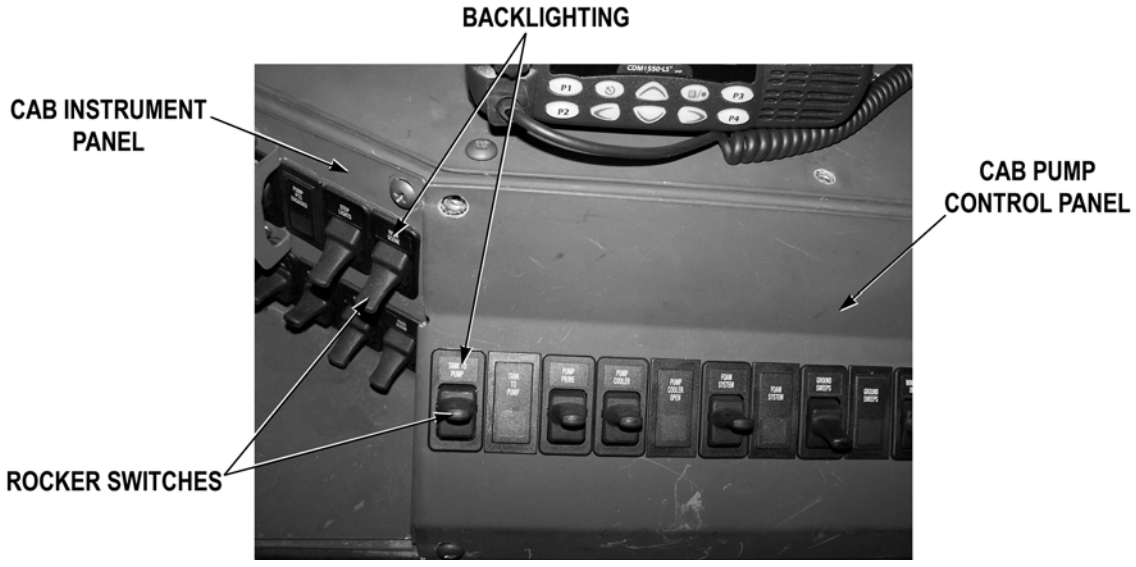
b. If there is no continuity, repair wire 1047 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Cut cab roof wire harness cab dome light butt splice connector wire 2640 (black) at driver side cab dome light. Check for continuity across wire 2640 (black) from cab roof wire harness cab dome light termination to a known good ground.

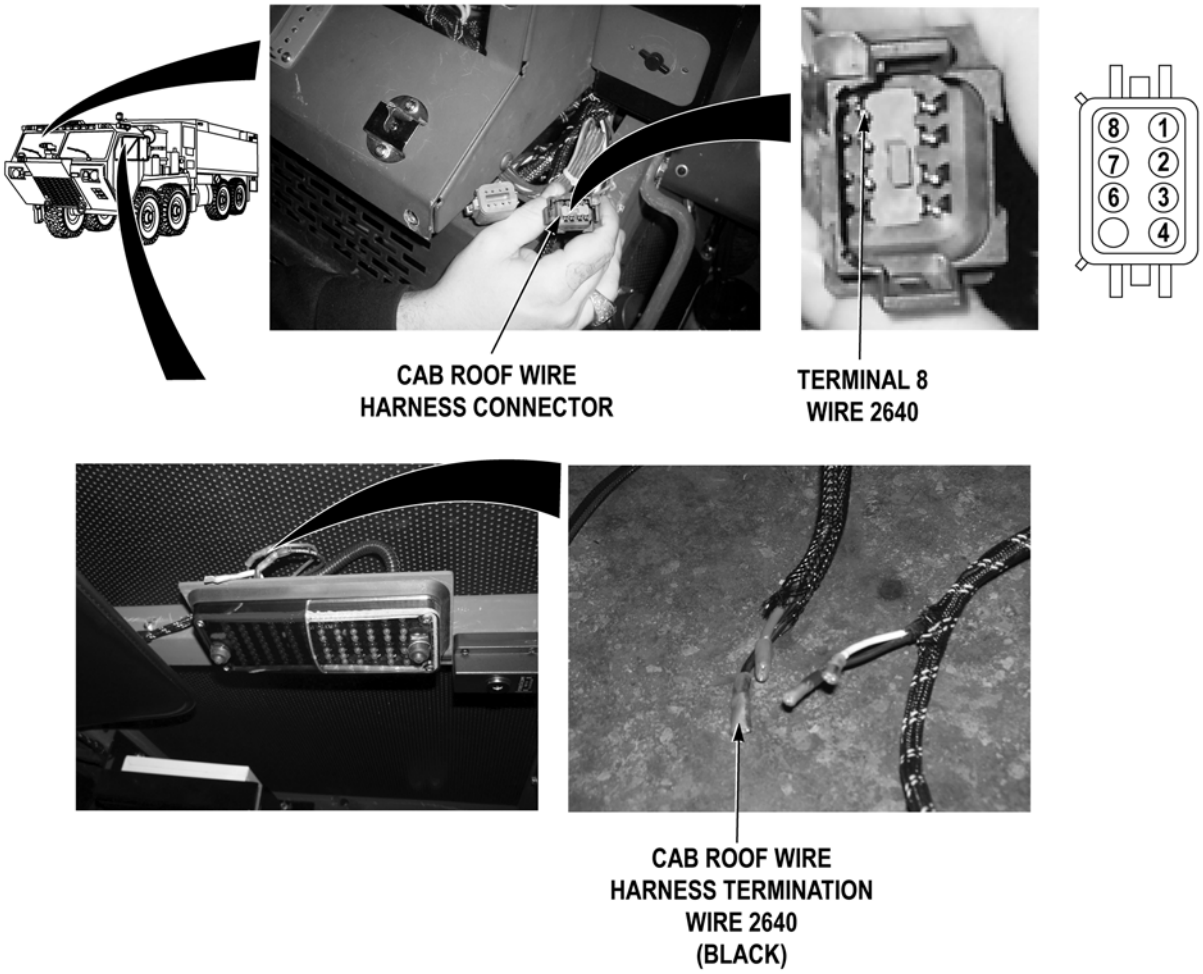
If there is continuity, replace cab dome light (WP 0233).



Step 13. Push battery disconnect switch to on position (WP 0007). Set light control PANEL lever to BRT (TM 9-2320-279-10). Check if cab switch backlights illuminate.

If cab backlights do not illuminate, replace cab ground terminal block (WP 0273).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Remove cab instrument panel assembly (WP 0202). Disconnect cab instrument panel wire harness cab roof wire harness connector. Check for continuity across cab roof wire harness wire 2640 (black) from cab roof wire harness cab dome light termination to cab instrument panel wire harness cab roof wire harness connector, terminal 8.

a. If there is continuity, repair wire 2640 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 2640 in cab roof wire harness if repairable (TM 9-2320-315-14&P), or replace cab roof wire harness (WP 0282).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

12-VOLT HANDHELD RADIO CHARGER(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

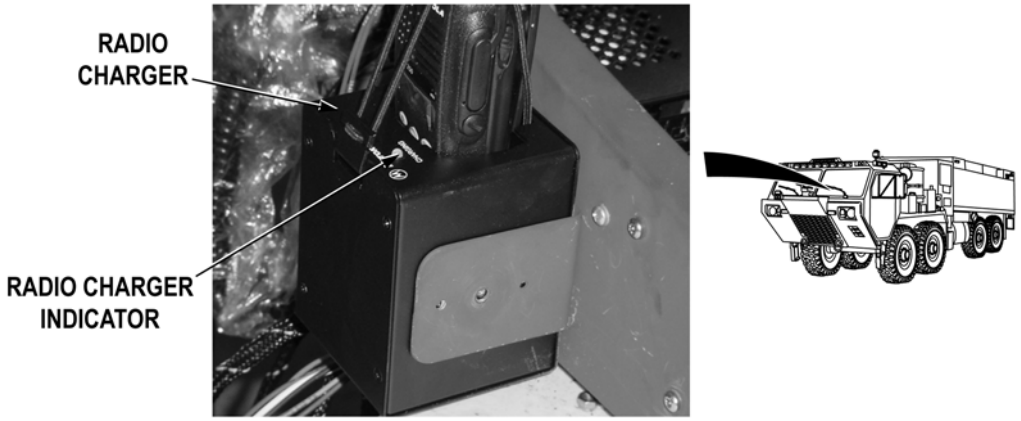
References
TM 9-2320-315-14&P
WP 0007
WP 0203
WP 0234
WP 0240

References (continued)
WP 0250
WP 0258
WP 0280
WP 0273

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

12-VOLT HANDHELD RADIO CHARGER(S) DOES NOT OPERATE



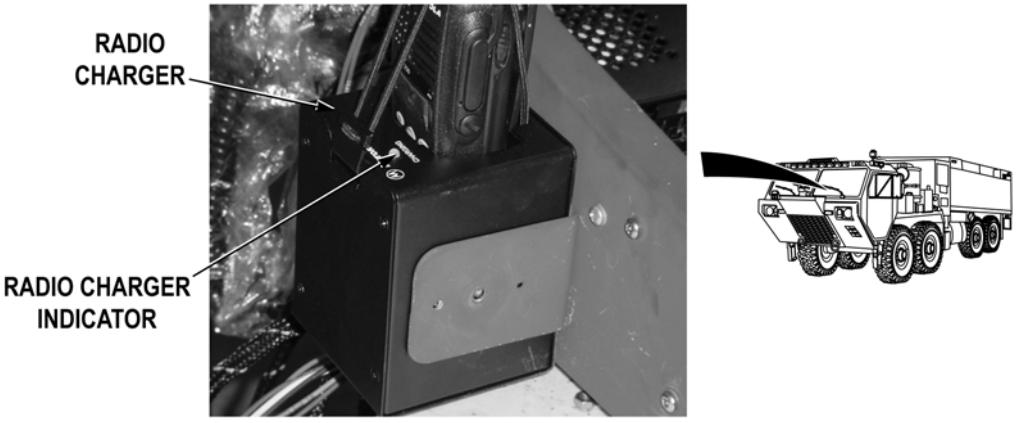
NOTE

Battery, or radio with battery, must be fully seated in radio charger before charger indicator will illuminate. The red indicator will illuminate when radio battery pack is charging, and green indicator will illuminate when radio battery pack is fully charged.

Step 1. Push battery disconnect switch to on position (WP 0007). With handheld radios seated in radio chargers, check if both radio charger indicators illuminate.

If both radio charger indicators illuminate, fault corrected.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



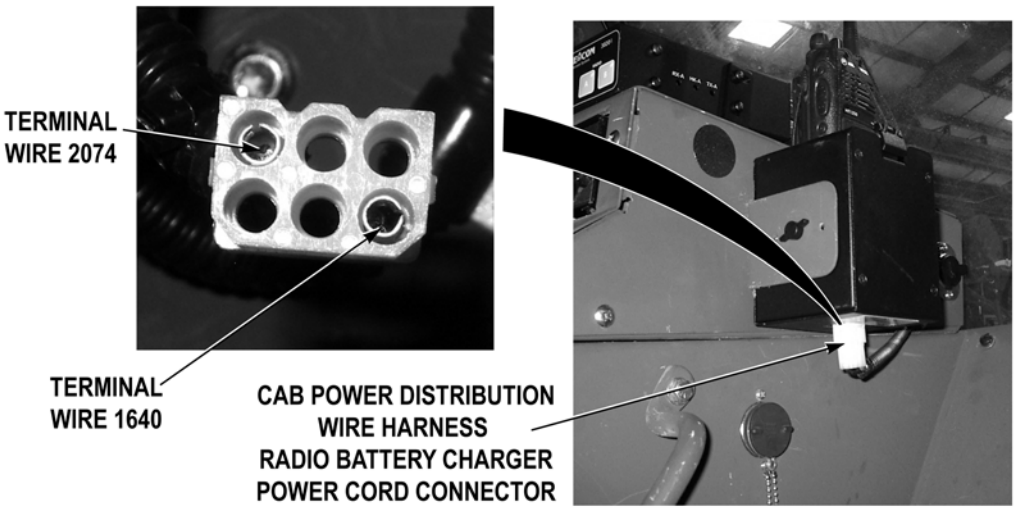
Step 2. With handheld radios seated in radio chargers, check if either radio charger indicators illuminate.

If both radio charger indicators do not illuminate, go to Step 6.

Step 3. Check if cab power distribution wire harness radio battery charger power cord connector is securely connected on non-operating radio charger.

If power cord in not securely connected, reconnect power cord (WP 0258).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Disconnect cab power distribution wire harness radio battery charger power cord connector from non-operating radio charger. Check for 10 to 14 VDC between wire 2074 (red) at cab power distribution wire harness radio battery charger power cord connector and a known good ground.

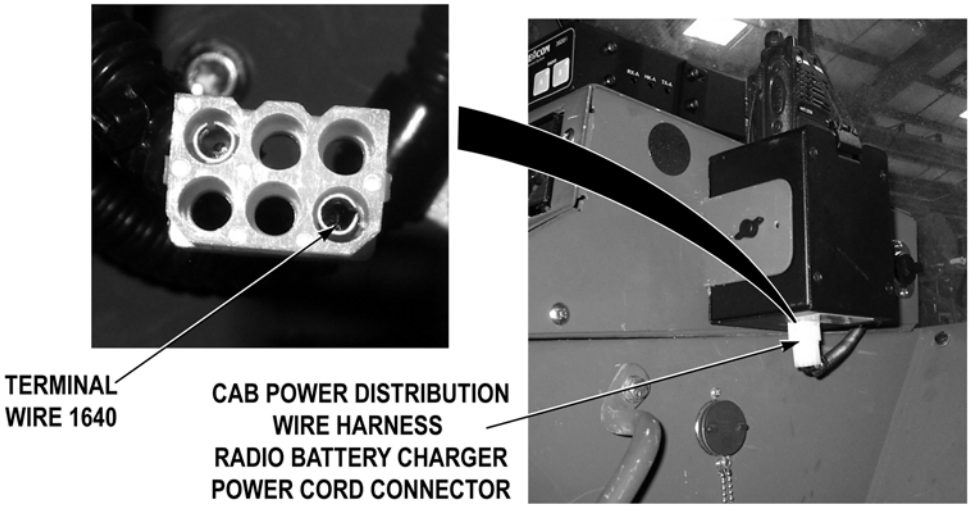
If 10 to 14 VDC are not present, repair wire 2074 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

Step 5. Pull battery disconnect switch to off position (WP 0007). Check for continuity across cab power distribution wire harness wire 1640 (black) from radio battery charger power cord connector to a known good ground.

a. If there is continuity, replace non-operating battery charger (WP 0258).

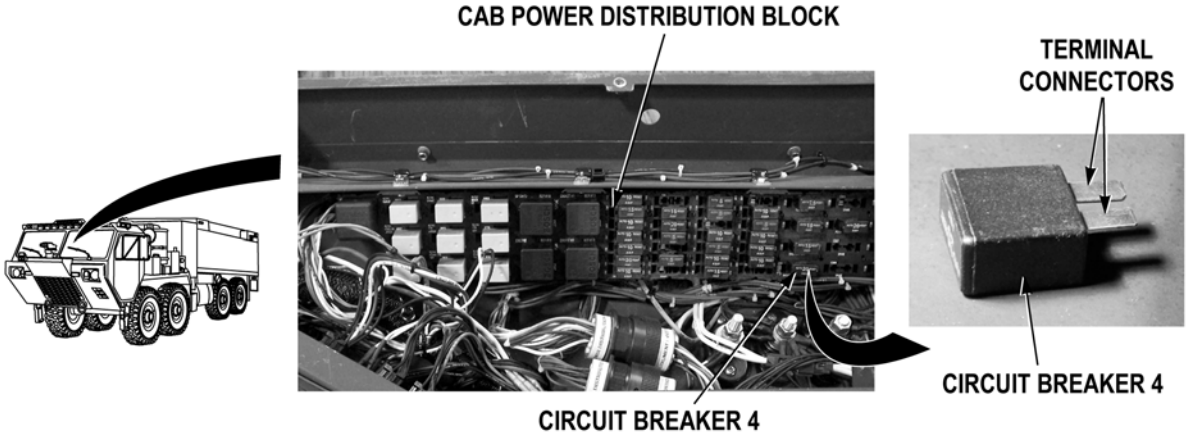
b. If there is no continuity, repair wire 1640 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Pull battery disconnect switch to off position (WP 0007). Disconnect cab power distribution wire harness radio battery charger power cord connector from either radio charger. Check for continuity across cab power distribution wire harness wire 1640 (black) from radio battery charger power cord connector to a known good ground.

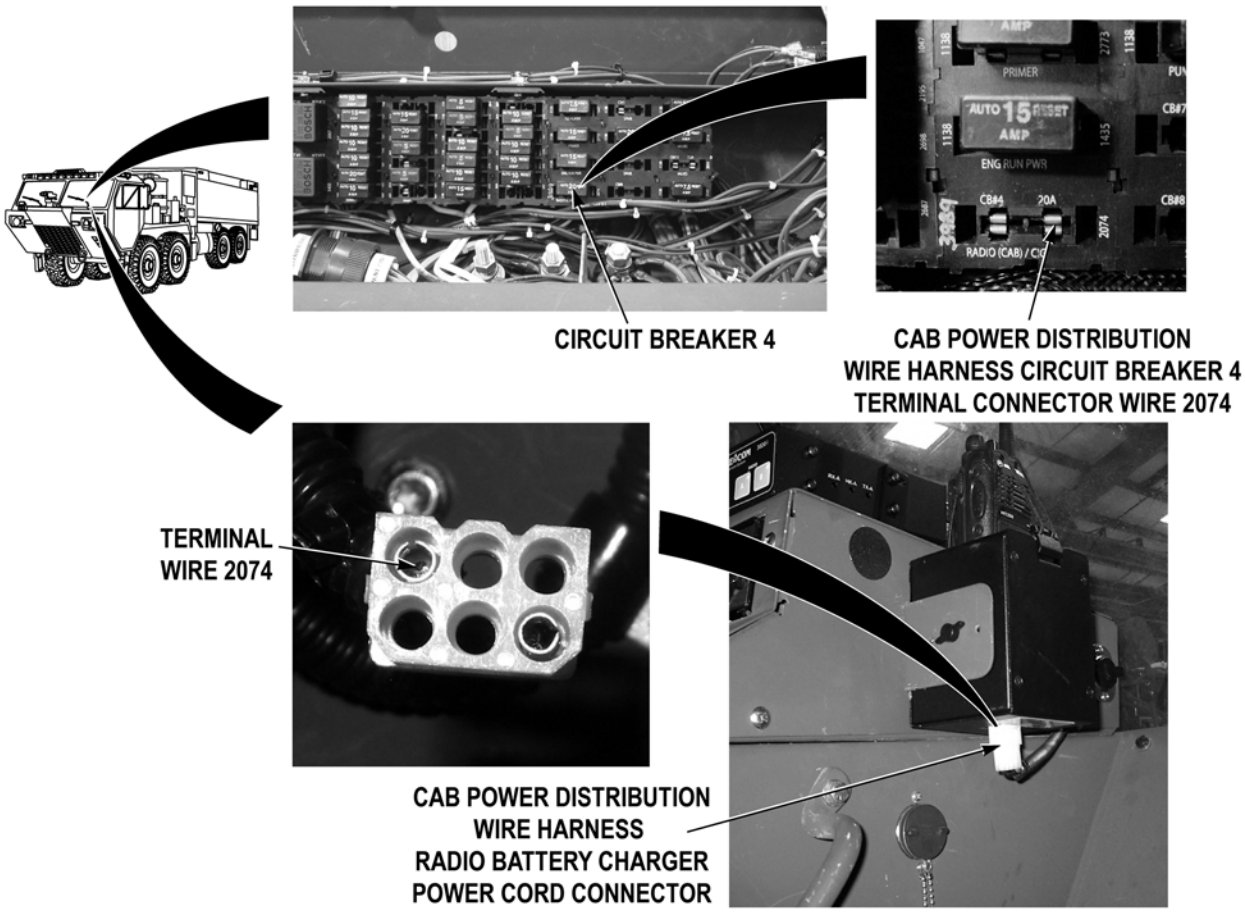
If there is no continuity, repair wire 1640 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).



Step 7. Remove cab instrument panel A (WP 0203). Remove circuit breaker 4 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker 4 (WP 0240).

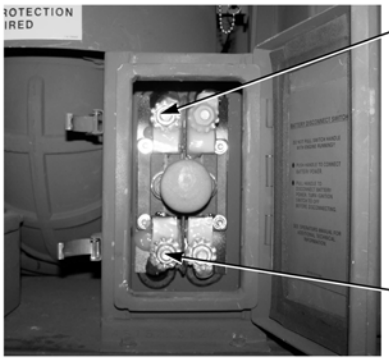
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 8. Check for continuity across wire 2074 (red) from cab power distribution wire harness circuit breaker 4 terminal connector, to cab power distribution wire harness radio battery charger power cord connector.

If there is no continuity, repair wire 2074 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



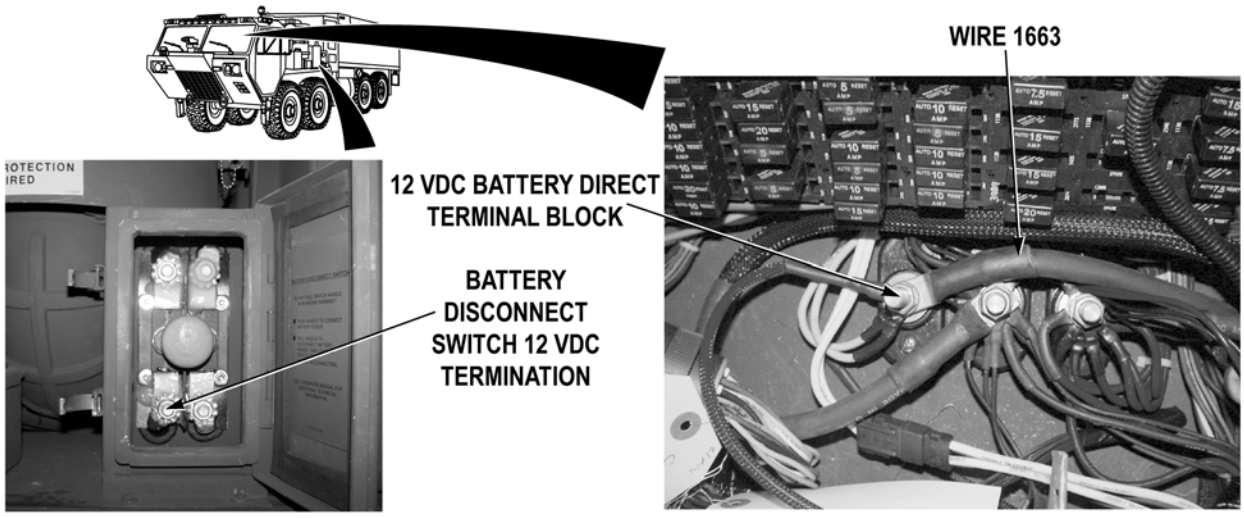
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 9. Disconnect batteries (TM 9-2320-315-14&P). Check battery disconnect switch terminations for loose and corroded connections.

If connections are loose or corroded, clean and tighten connections or replace battery disconnect switch (WP 0234).

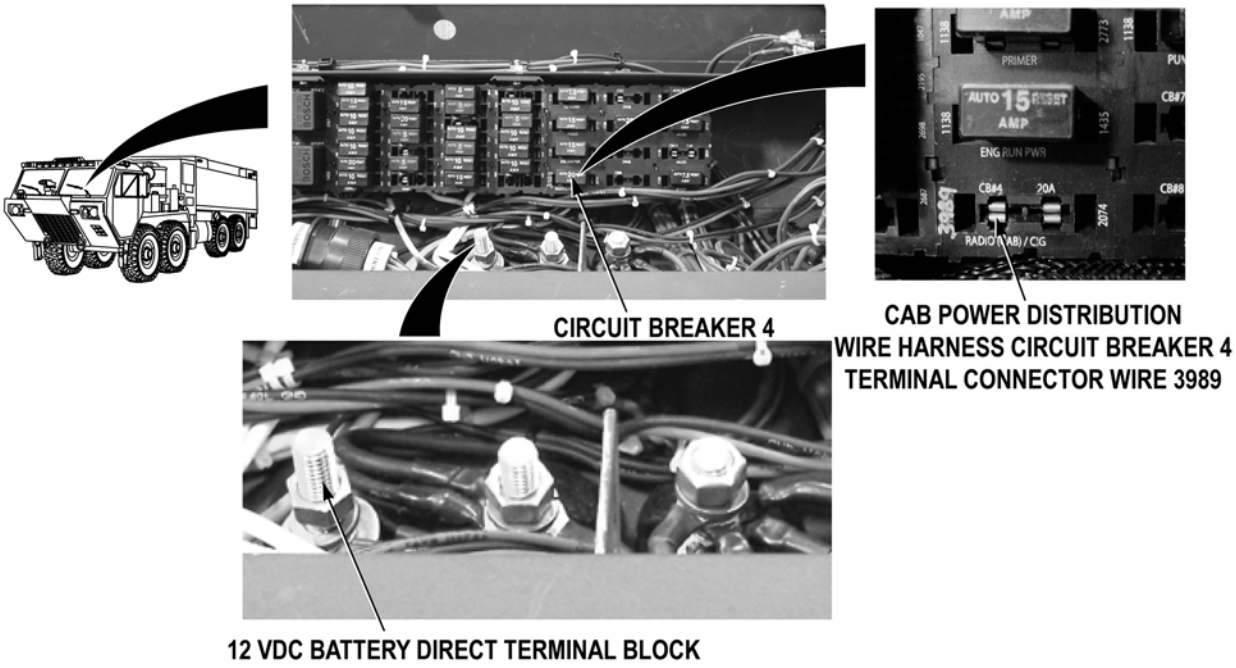
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Check for continuity across wire 1663 (red) from battery disconnect switch to cab 12 VDC battery direct terminal block.

If there is continuity, repair wire 1663 if repairable (TM 9-2320-315-14&P), or replace wire 1663 between battery disconnect switch and 12 VDC battery direct terminal block (WP 0250).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Check for continuity across cab power distribution wire harness wire 3989 (red) from cab 12 VDC battery direct terminal block to cab power distribution wire harness circuit breaker 4 terminal connector.

a. If there is no continuity, repair wire 3989 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is continuity, replace cab 12 VDC battery direct terminal block (WP 0273).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

12-VOLT STREAMLIGHT CHARGER(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

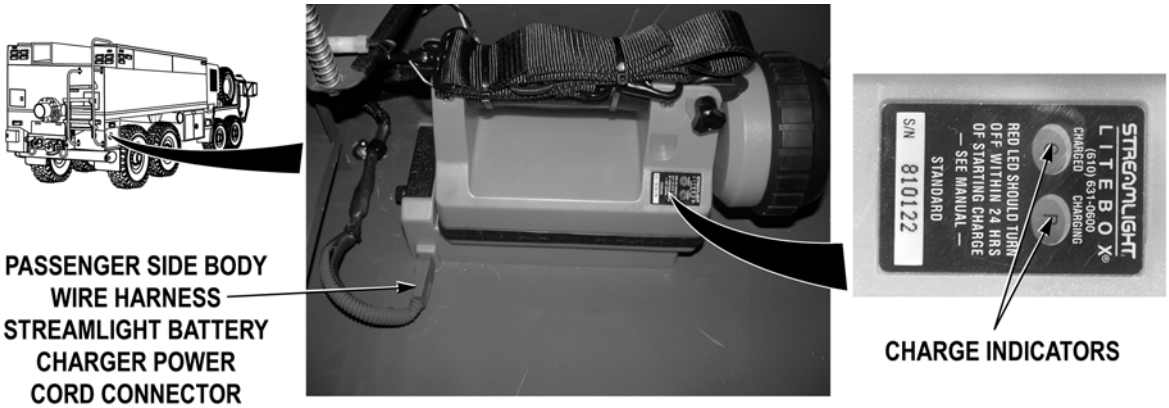
References
TM 9-2320-315-14&P
WP 0007
WP 0203
WP 0234

References (continued)
WP 0250
WP 0254
WP 0260
WP 0293
WP 0299

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

12-VOLT STREAMLIGHT CHARGER(S) DOES NOT OPERATE



NOTE

Streamlight assembly must be fully seated in streamlight charger before charge indicator on streamlight assembly will illuminate. Red indicator will illuminate when streamlight battery pack is charging, and green indicator will illuminate when streamlight battery pack is fully charged.

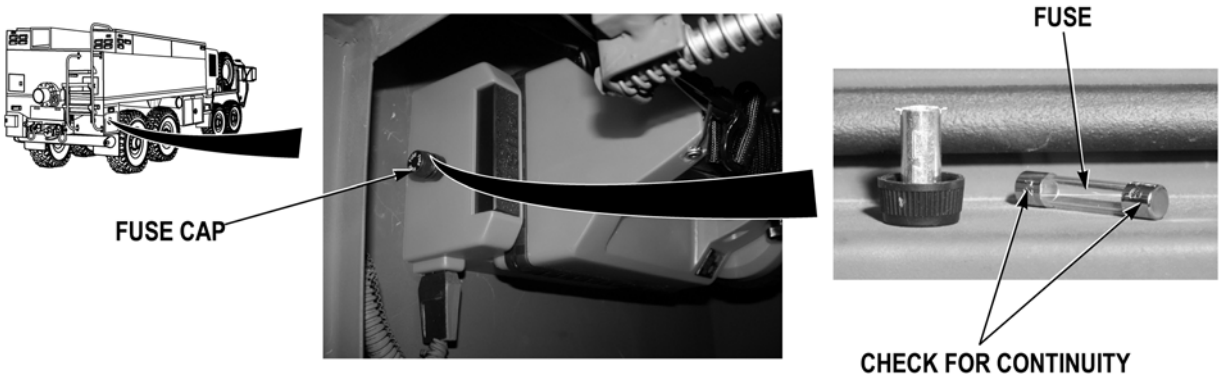
Step 1. Push battery disconnect switch to on position (WP 0007). With streamlights seated in streamlight chargers, check if streamlight charge indicators illuminate.

If neither streamlight charge indicator illuminates, go to Step 7.

Step 2. Check if passenger side body wire harness streamlight battery charger power cord connector is fully connected on non-operating streamlight charger.

If power cord in not fully connected, reconnect power cord (WP 0260).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

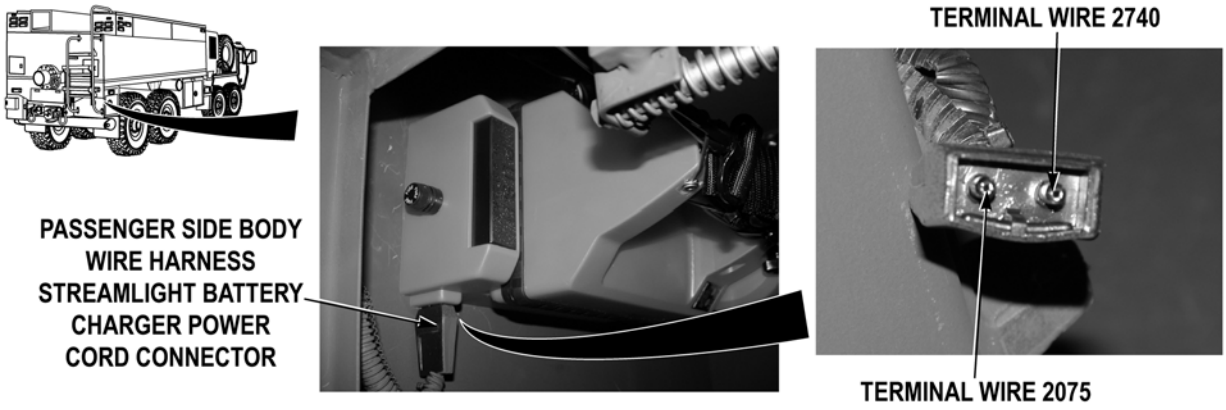
Step 3. Remove fuse from base of streamlight battery charger (WP 0260). Check for continuity across fuse.

If there is no continuity, replace fuse (WP 0260).

Step 4. Install fuse in base of streamlight battery charger. Swap streamlight at non-operating streamlight charger with a known good streamlight. Check if streamlight charge indicator illuminates.

If streamlight charge indicator illuminates, replace non-operating streamlight (WP 0260).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Disconnect passenger side body wire harness streamlight battery charger power cord connector from non-operating streamlight charger. With a test lead set, check for 10 to 14 VDC between wire 2075 (red) at passenger side body wire harness streamlight battery charger power cord connector and a known good ground.

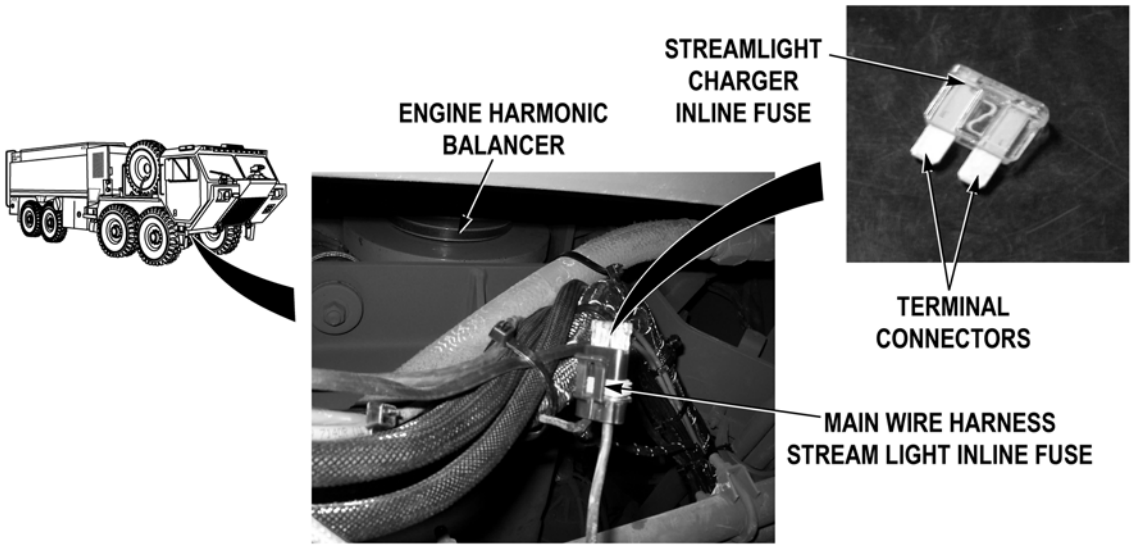
If 10 to 14 VDC are not present, repair wire 2075 in streamlight battery charger wire (TM 9-2320-315-14&P), or replace streamlight battery charger and connector (WP 0260).

Step 6. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across passenger side body wire harness wire 2740 (black) from passenger side body wire harness streamlight battery charger power cord connector to a known good ground.

a. If there is no continuity, repair wire 2740 in streamlight battery charger wire (TM 9-2320-315-14&P), or replace streamlight battery charger and connector (WP 0260).

b. If there is continuity, replace non-operating battery charger (WP 0260).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



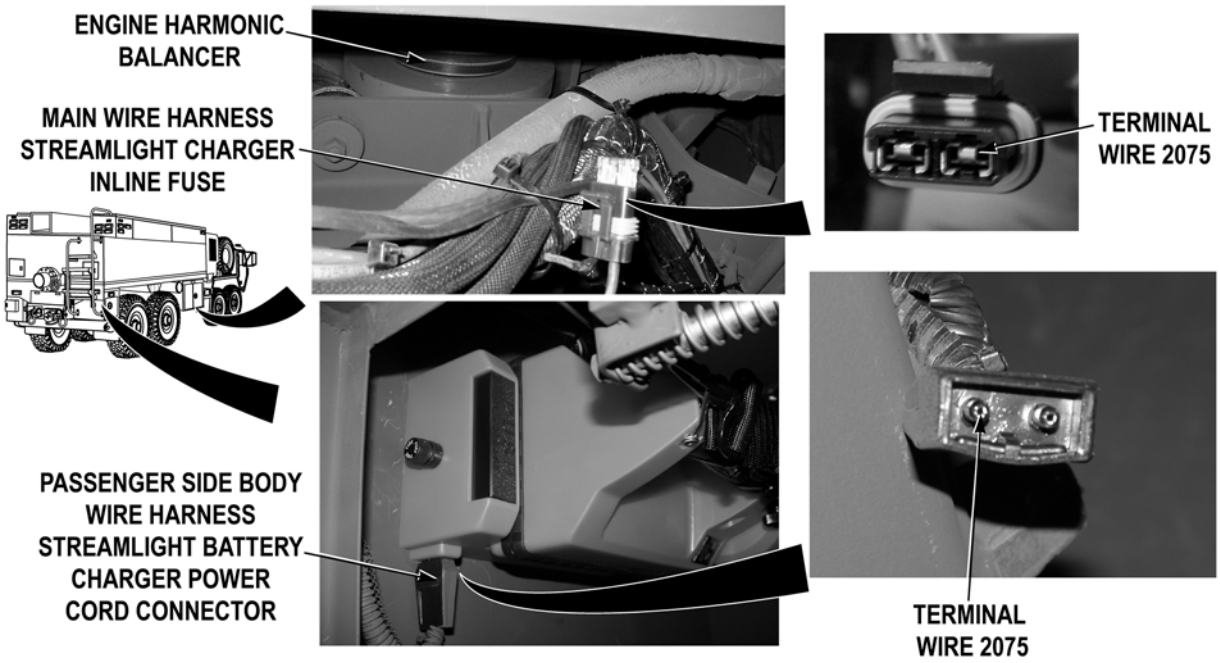
Step 7. Pull battery disconnect switch to off position (WP 0007). Remove main wire harness streamlight charger inline fuse (WP 0254). Check for continuity across fuse.

If there is no continuity, replace fuse (WP 0254).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 8. Disconnect passenger side body wire harness streamlight battery charger power cord connector from either streamlight charger. With a test lead set, check for continuity across wire 2740 (black) from passenger side body wire harness streamlight battery charger power cord connector to a known good ground.

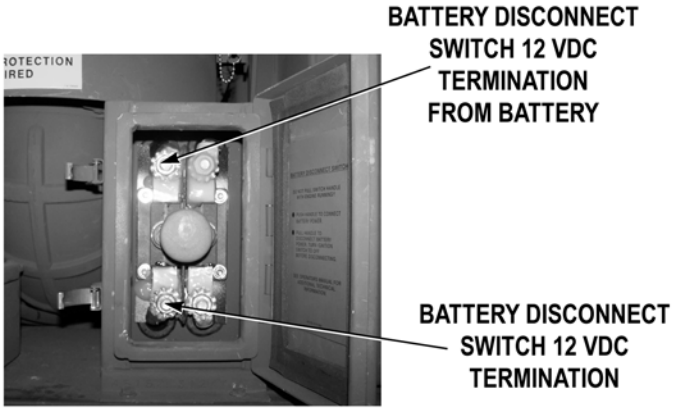
If there is no continuity, go to Step 13.



Step 9. With a test lead set, check for continuity across wire 2075 (red) from main wire harness streamlight charger inline fuse connector terminal to passenger side body wire harness streamlight battery charger power cord connector terminal.

If there is no continuity, go to Step 12.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



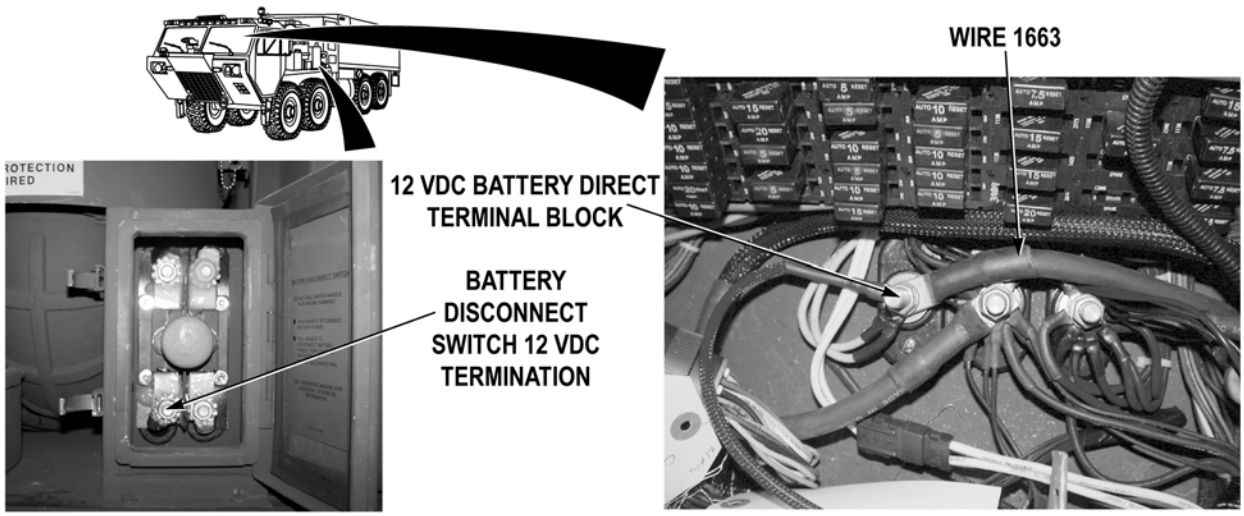
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 10. Install streamlight charger inline fuse (WP 0254). Disconnect batteries (TM 9-2320-315-14&P). Check battery disconnect switch terminations for loose and corroded connections.

If connections are loose or corroded, clean and tighten connections or replace battery disconnect switch (WP 0234).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

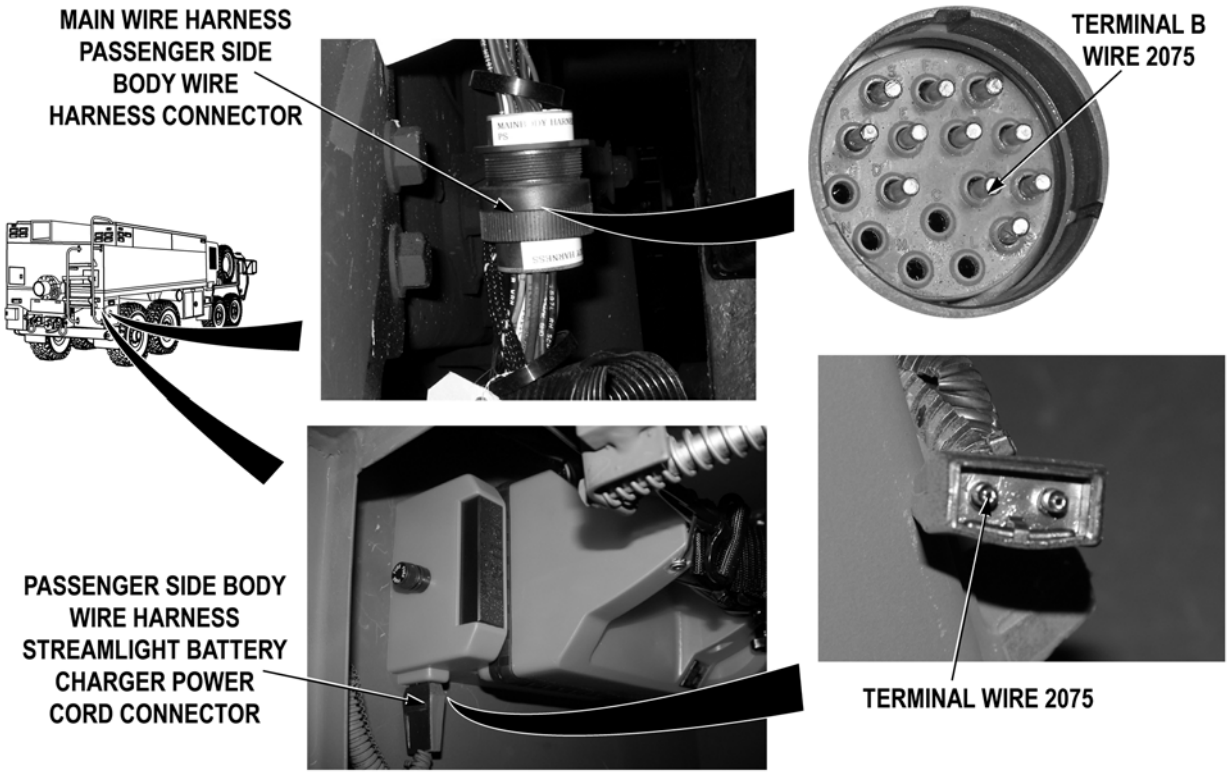
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 11. Remove cab instrument panel A (WP 0203). With a test lead set, check for continuity across high amperage wire 1663 (red) from battery disconnect switch to cab 12 VDC battery direct power stud.

a. If there is continuity, repair wire 1663 in between vehicle battery and battery disconnect switch if repairable (TM 9-2320-315-14&P), or replace wire 1663 between vehicle battery and battery disconnect switch (WP 0250).

b. If there is no continuity, repair wire 1663 in between battery disconnect switch to cab 12 VDC battery disconnect switch to cab 12 VDC battery direct power stud if repairable (TM 9-2320-315-14&P), or replace wire 1663 from battery disconnect switch to cab 12 VDC battery direct power stud (WP 0250).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

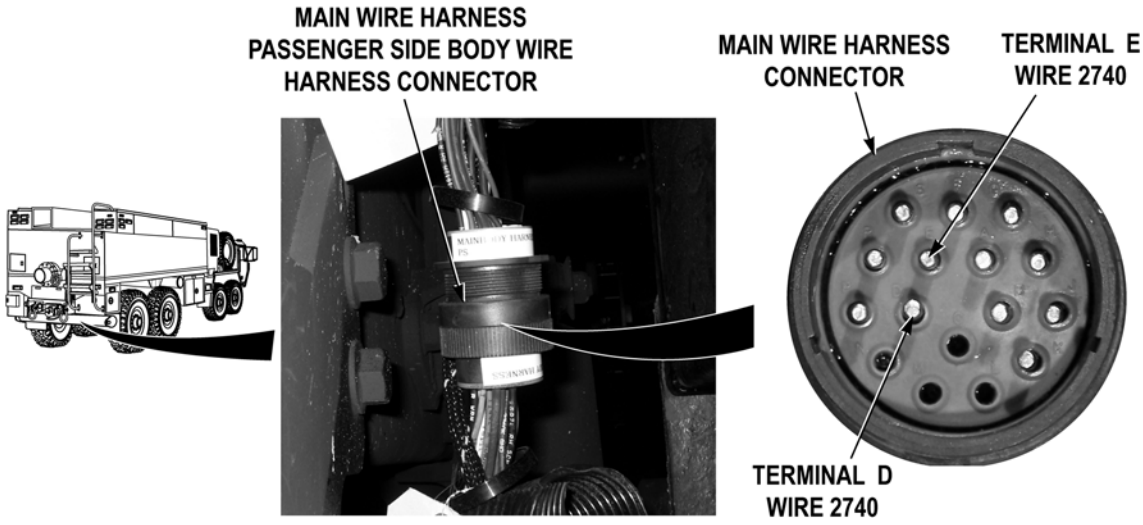
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 12. Install streamlight charger inline fuse (WP 0254). Disconnect main wire harness passenger side body wire harness connector. With a lead test set, check for continuity across passenger side body harness wire 2075 (red) from passenger side body wire harness connector, terminal B to streamlight battery charger power cord connector terminal.

a. If there is continuity, repair wire 2075 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 2075 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Install streamlight charger inline fuse (WP 0254). Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from main wire harness passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in maine wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

24-VOLT BATTERY CHARGER DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

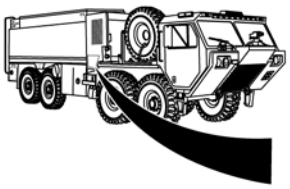
References
TM 9-2320-315-14&P
TM 9-6140-200-14
WP 0004
WP 0008
WP 0029

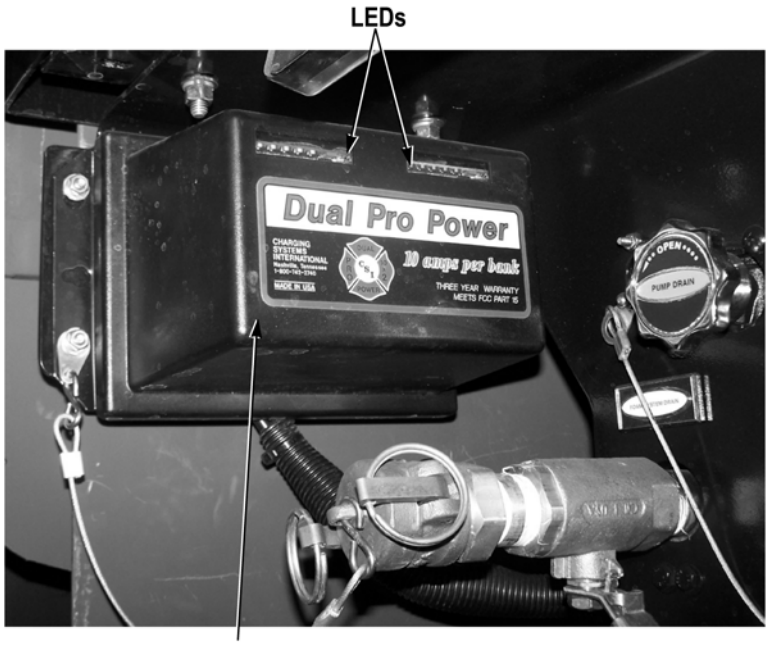
References (continued)
WP 0235
WP 0237
WP 0267
WP 0307
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

24-VOLT BATTERY CHARGER DOES NOT OPERATE PROPERLY

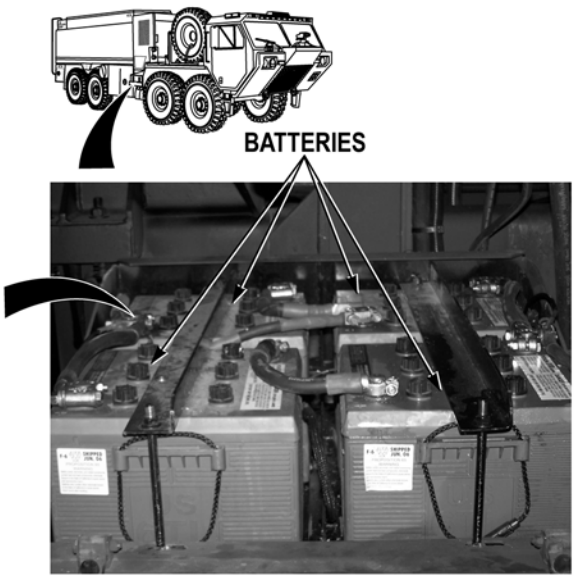




Step 1. Connect shoreline inlet power cord between SHORELINE INLET receptacle and 110 VAC power source (WP 0029). Open passenger side pump house control access door (WP 0008). Check if 24-volt battery charger LEDs illuminate.

If 24-volt battery charger LEDs do not illuminate, go to Step 6.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



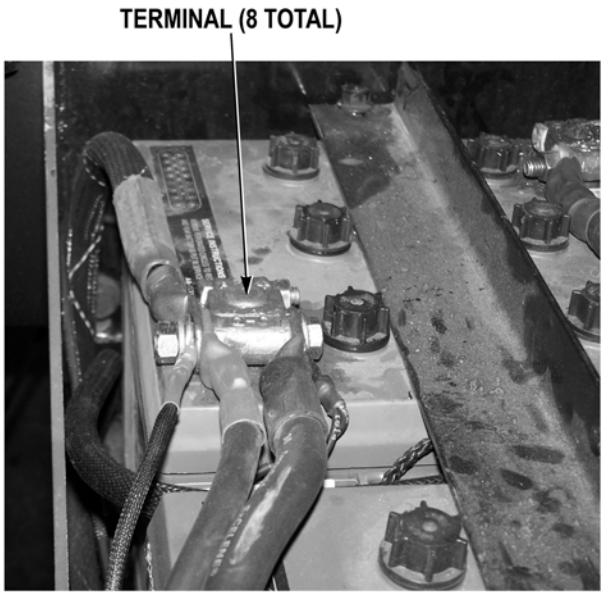
WARNING

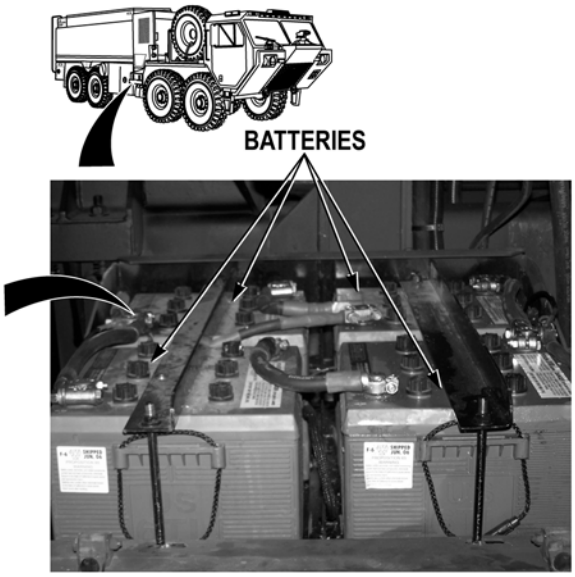
Wear proper eye protection when working around batteries. Do not allow smoking, flames, or hot objects around batteries. If battery is giving off gases, it can explode. Failure to comply may result in injury or death to personnel.

Step 2. Open battery box (TM 9-2320-315-14&P). Inspect all batteries for dirt, corrosion, and loose battery terminals.

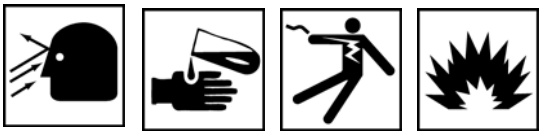
If battery terminals are dirty, corroded, or loose, clean and service batteries (TM 9-6140-200-14).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





WARNING



Wear proper eye protection when working around batteries. Do not allow smoking, flames, or hot objects around batteries. If battery is giving off gases, it can explode. Failure to comply may result in injury or death to personnel.

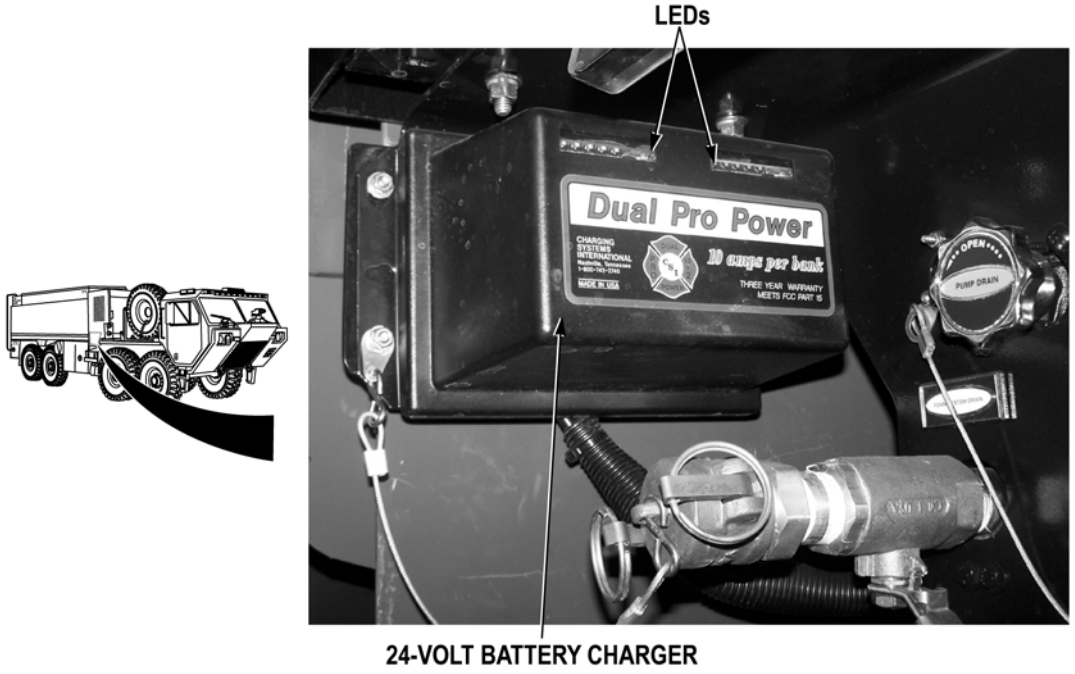
Step 3. Charge batteries (TM 9-2320-315-14&P). Disconnect battery terminals and cables (TM 9-2320-315-14&P). Check condition of each battery by performing a specific gravity test (TM 9-6140-200-14).

If any battery fails specific gravity test, replace each individual failed battery (TM 9-2320-315-14&P).

Step 4. Check each individual battery by performing a battery load test (TM 9-6140-200-14). Reconnect batteries (TM 9-2320-315-14&P).

If any battery fails load test, replace each individual failed battery (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

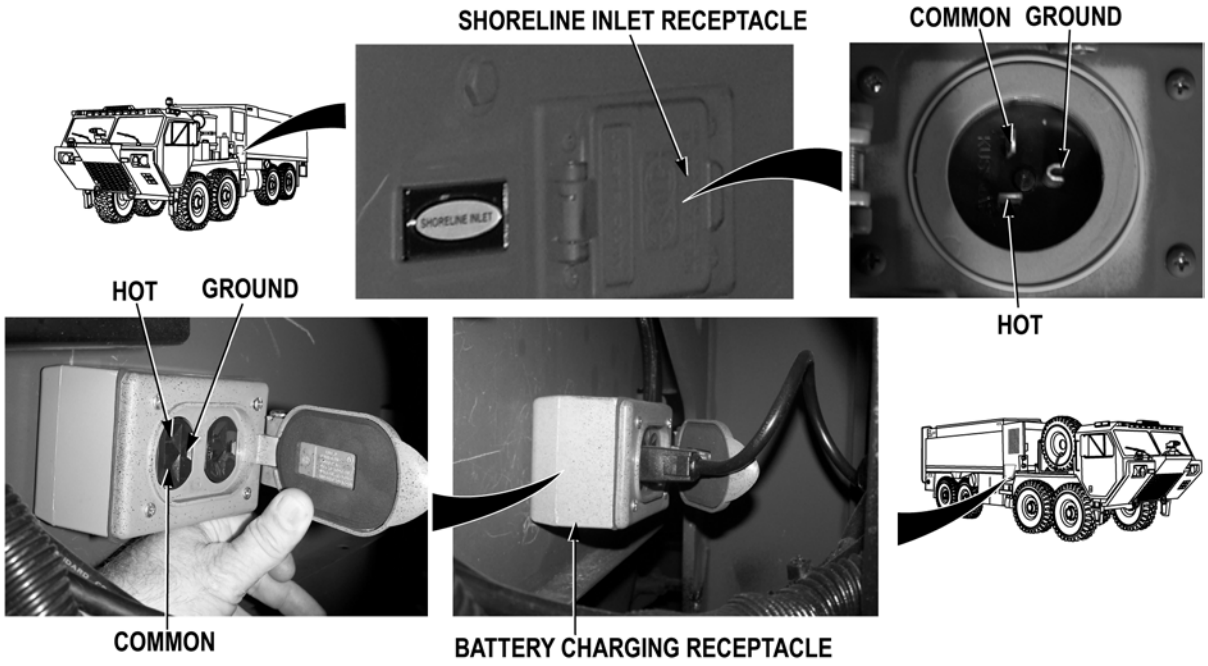


Step 5. Operate 24-volt battery charger for a minimum of sixteen hours. Check if 24-volt battery charger green LEDs illuminate, indicating a full charge.

a. If 24-volt battery charger green LEDs illuminate, problem corrected.

b. If 24-volt battery charger green LEDs do not illuminate, replace 24-volt battery charger (WP 0235).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

110 Volt AC power is potentially lethal. Do not work on AC wiring when it is connected to a power source. Failure to comply may cause injury or death to personnel.

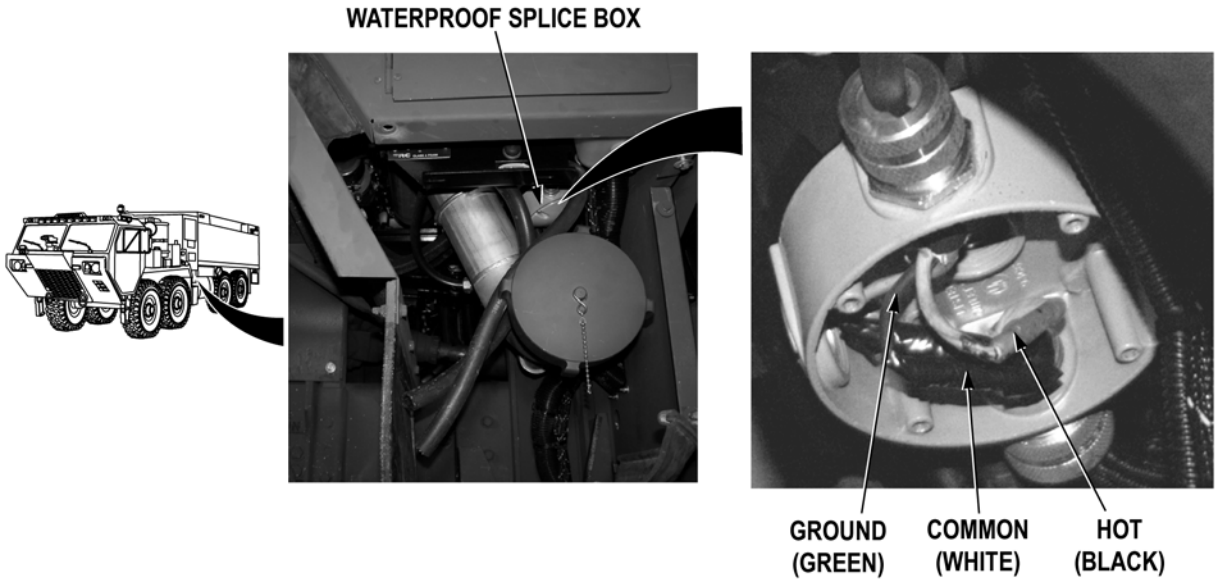
NOTE

SHORELINE INLET receptacle plunger must be fully engaged for continuity to be observed for Step 6.

Step 6. Remove pump house panel B (WP 0341). Disconnect shoreline inlet power cord from SHORELINE INLET receptacle and 110 VAC power source (WP 0029). Disconnect 24-volt battery charger power cord from 120-volt receptacle. With a test lead set, check for continuity across shoreline power cord hot wire, from SHORELINE INLET receptacle hot terminal to 120-volt receptacle hot terminal. Continue continuity check across common wire and ground wire.

If there is continuity at all wires, go to Step 9.

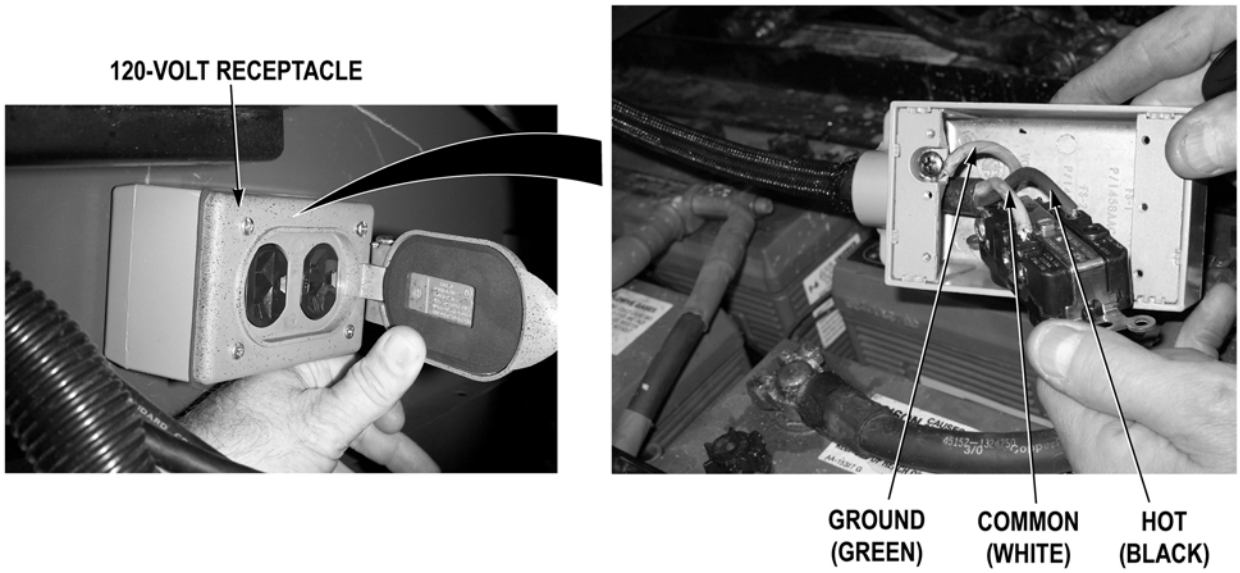
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Remove waterproof splice box cover from waterproof splice box (WP 0307). Remove shoreline inlet power cord wire connectors from hot wire (black), common wire (white), and ground wire (green) (WP 0307). Check for continuity across shoreline power cord from 120-volt receptacle hot terminal to shoreline power cord termination (black) at waterproof splice box. Continue continuity checks across common wire (white) and ground wire (green).

If there is continuity across all wires, replace SHORELINE INLET receptacle (WP 0267).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

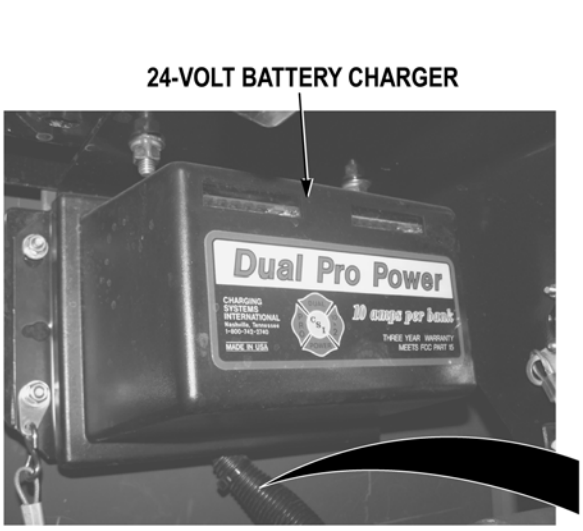


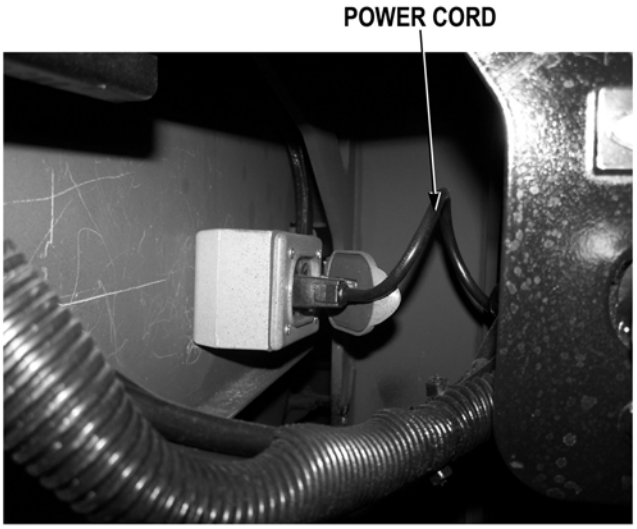
Step 8. Remove 120-volt receptacle (WP 0237). Check for continuity across shoreline power cord from 120-volt receptacle hot wire termination (black) to termination (black) at waterproof splice box. Continue continuity checks across common wire (white) and ground wire (green).

a. If there is continuity across all wires, replace 120-volt receptacle (WP 0237).

b. If there is no continuity across any wire, replace shoreline power cord (WP 0237).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





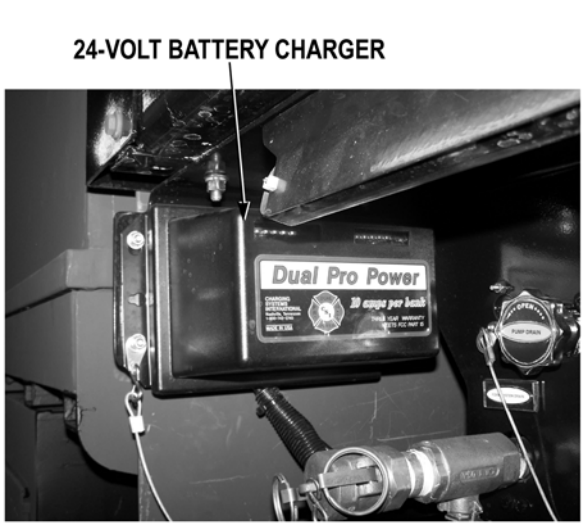
WARNING

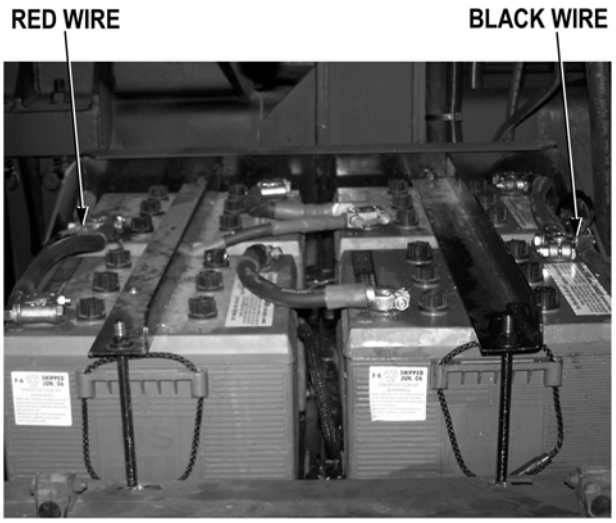
Do not disassemble 24-volt battery charger. Incorrect reassembly may result in risk of electrical shock or fire. Failure to comply may result in injury or death to personnel or damage to equipment.

Step 9. Check if 24-volt battery charger and power cord are free from excessive wear and damage.

If 24-volt battery charger or power cord are not free from damage, replace 24-volt battery charger (WP 0235).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





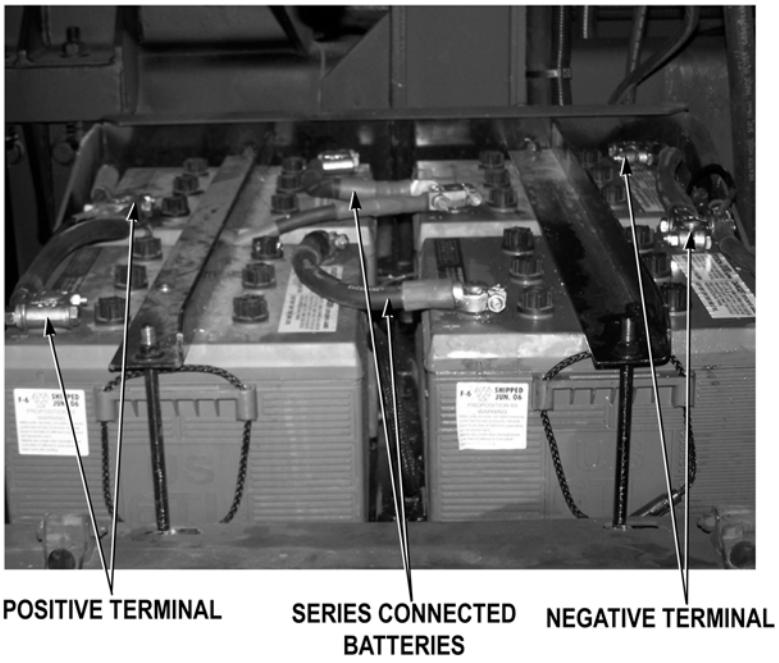
WARNING

Wear proper eye protection when working around batteries. Do not allow smoking, flames, or hot objects around batteries. If battery is giving off gases, it can explode. Failure to comply may result in injury or death to personnel

Step 10. Disconnect batteries (TM 9-2320-315-14&P). Inspect 24-volt battery charger red and black wires from 24-volt battery charger to battery terminations.

If 24-volt battery charger red or black wire are damaged, repair wires if repairable (TM 9-2320-315-14&P), or replace 24-volt battery charger (WP 0235).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Reconnect batteries (TM 9-2320-315-14&P). Check for at least 10 VDC between series connected batteries from positive terminal to negative terminal.

a. If at least 10 VDC are present, replace 24-volt battery charger (WP 0235).

b. If there is less than 10 VDC, replace batteries (TM 9-2320-315-14&P).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

CLEARANCE AND/OR DIRECTIONAL LIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

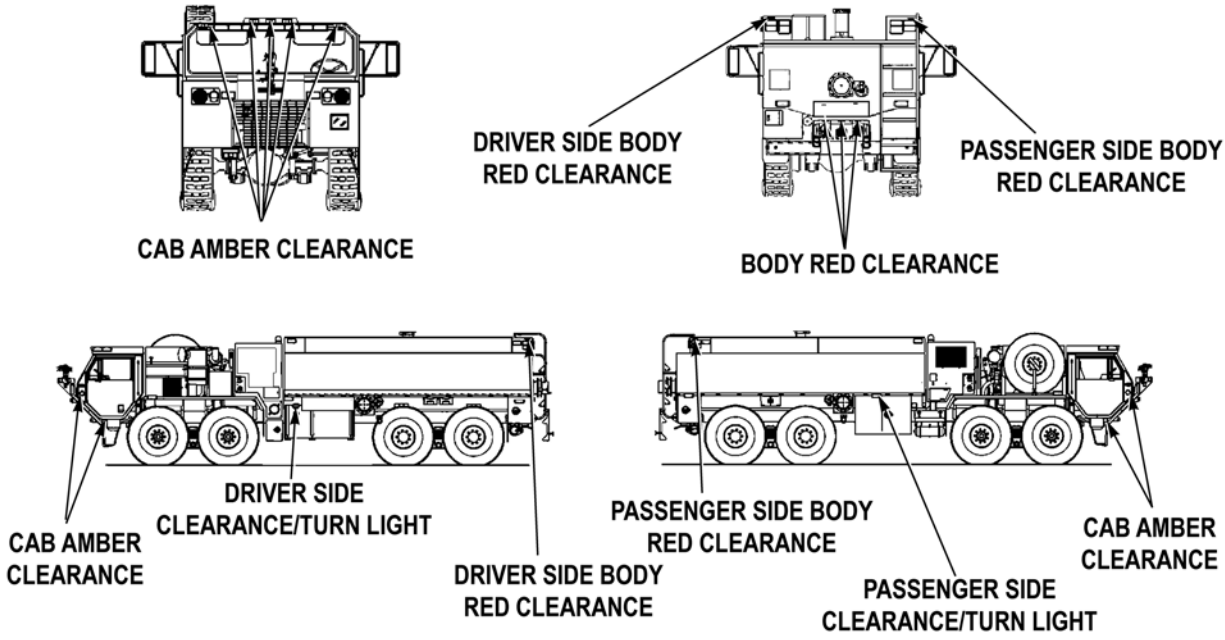
References
TM 9-2320-315-14&P
WP 0007
WP 0203
WP 0225
WP 0226
WP 0227
WP 0240

References (continued)
WP 0242
WP 0279
WP 0280
WP 0287
WP 0293
WP 0299
WP 0337

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

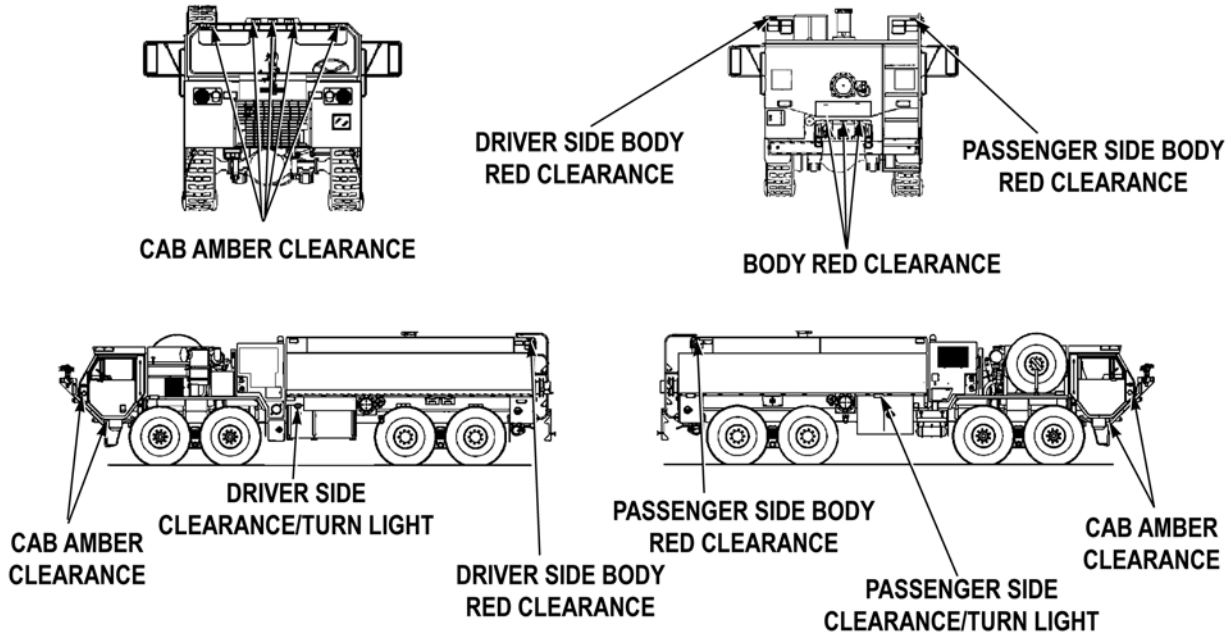
CLEARANCE AND/OR DIRECTIONAL LIGHT(S) DOES NOT OPERATE



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Turn On Clearance Lamps (TM 9-2320-279-10). Check if all clearance lights on body operate.

If all clearance lights on body operate, go to Step 28.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Check if cab clearance lights operate.

If cab clearance lights do not operate, troubleshoot Clearance and Side Markers Do Not Operate (TM 9-2320-315-14&P).

Step 3. Check if at least one clearance light on body operates.

If all clearance lights on body do not operate, go to Step 20.

WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

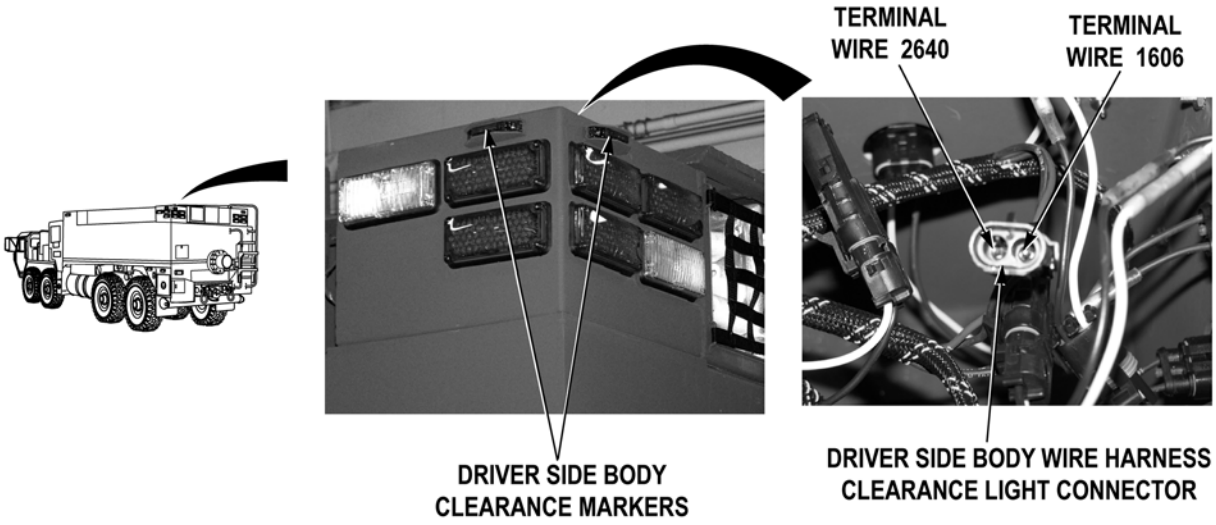
Step 4. Check if non-operating clearance light is located on driver side of body.

If non-operating clearance light is not located on driver side, go to Step 11.

Step 5. Check if at least one driver side clearance light operates.

If both driver side clearance lights do not operate, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Remove driver side rear light bezel cover (WP 0337). Disconnect driver side body wire harness clearance light connector. With a test lead set, check for 22 to 28 VDC between wire 1606 (green) at driver side body wire harness clearance light connector, terminals and a known good ground.

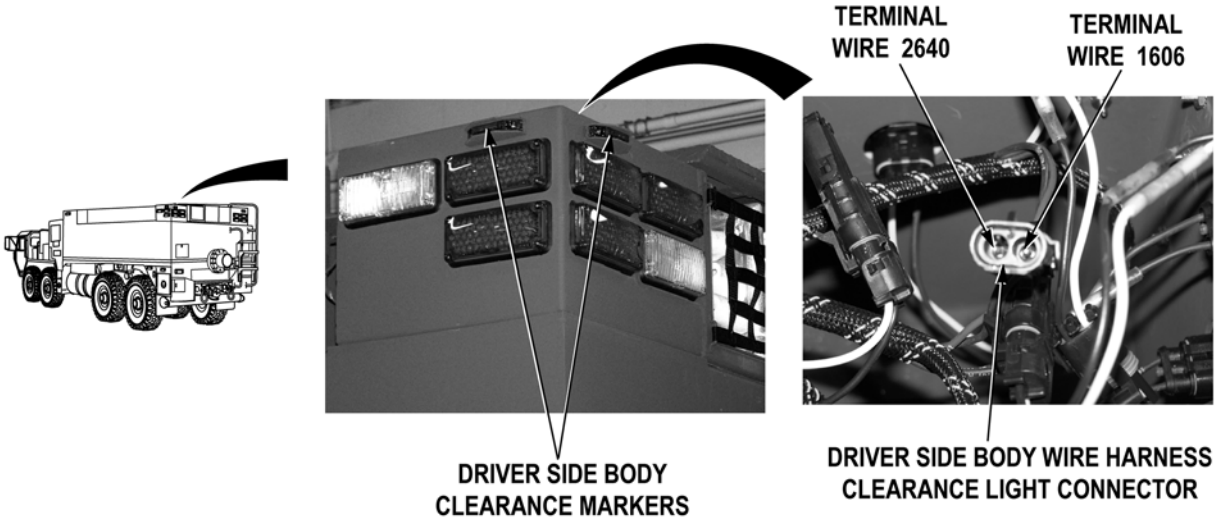
If 22 to 28 VDC are not present, repair wire 1606 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

Step 7. Turn Off Clearance Lamps (TM 9-2320-279-10). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2640 (black) from driver side body wire harness clearance light connector, terminals to a known good ground.

a. If there is continuity, replace non-operating clearance light (WP 0227).

b. If there is no continuity, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



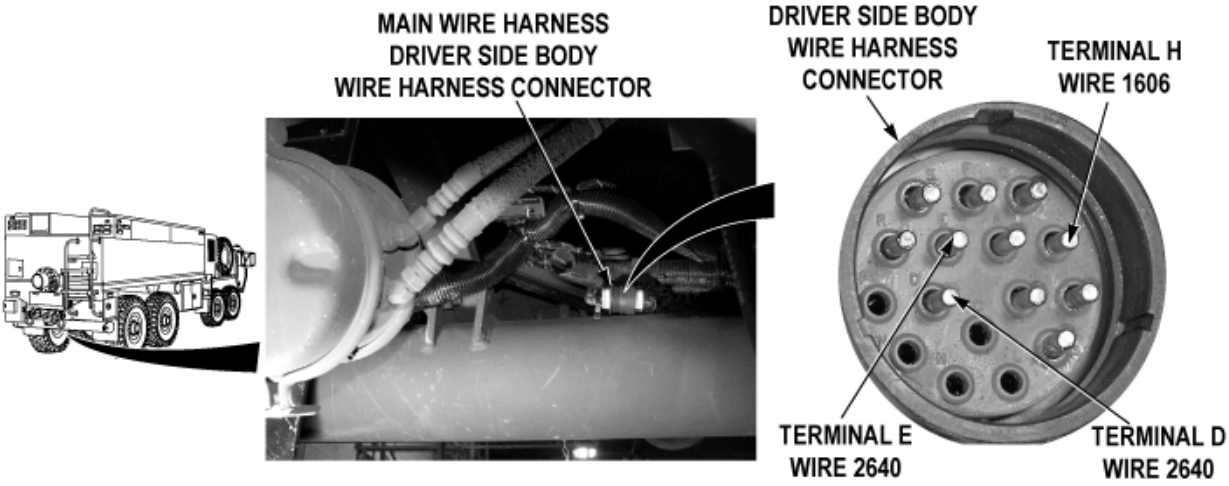
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 8. Remove driver side rear light bezel cover (WP 0337). Disconnect driver side body wire harness clearance light connector. With a test lead set, check for 22 to 28 VDC between wire 1606 (green) at driver side body wire harness clearance light connector terminal and a known good ground.

If 22 to 28 VDC are not present, go to Step 10.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 9. Turn Off Clearance Lights (TM 9-2320-279-10). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2640 (black) from main wire harness driver side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 10. Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for 22 to 28 VDC between wire 1606 (green) at main wire harness driver side body wire harness connector, terminal H and a known good ground.

a. If 22 to 28 VDC are present, repair wire 1606 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If 22 to 28 VDC are not present, repair wire 1606 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

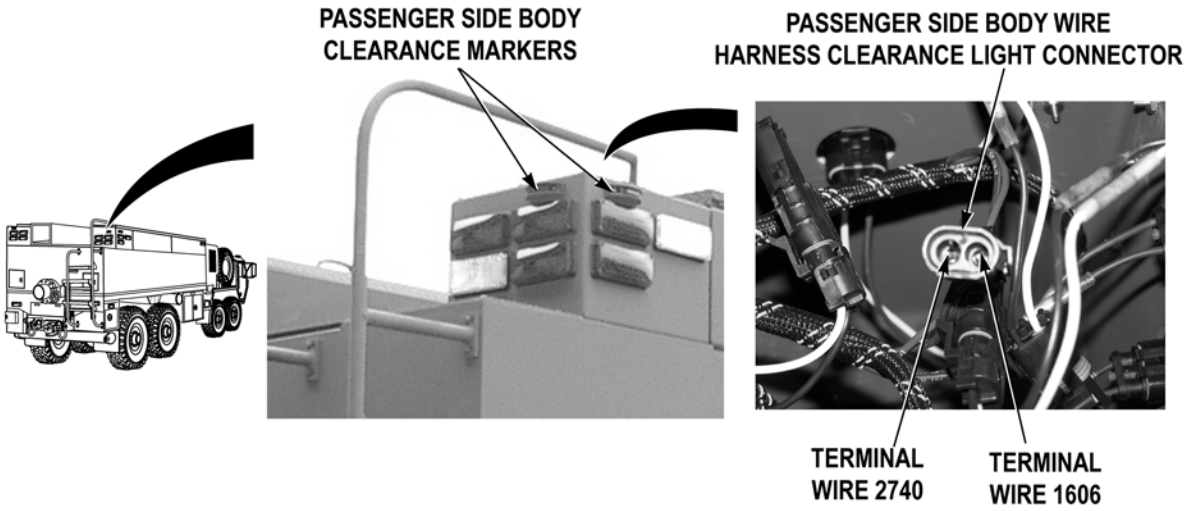
Step 11. Check if non-operating clearance lights are located on passenger side of body.

If non-operating clearance light is not located on passenger side, go to Step 18.

Step 12. Check if at least one passenger side clearance light operates.

If both passenger side clearance lights do not operate, go to Step 15.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Remove passenger side light bezel cover (WP 0337). Disconnect passenger side body wire harness clearance light connector. Check for 22 to 28 VDC between wire 1606 (green) at passenger side body wire harness clearance light connector, terminal and a known good ground.

If 22 to 28 VDC are not present, repair wire 1606 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

Step 14. Turn Off Clearance Lamps (TM 9-2320-279-10). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across wire 2740 (black) from passenger side body wire harness at passenger side body wire harness clearance light connector, terminal to a known good ground.

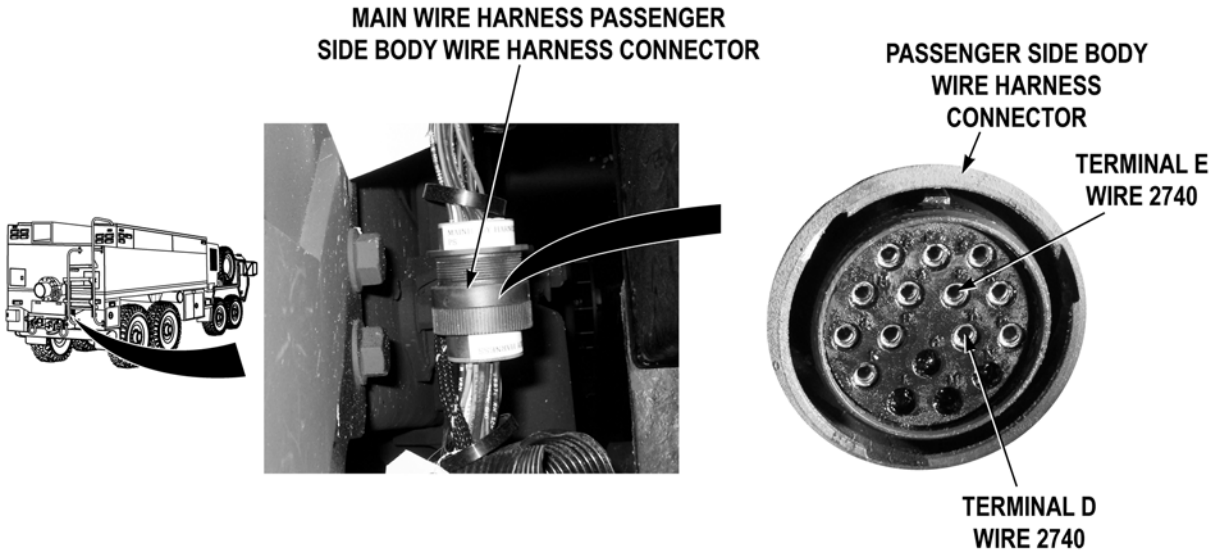
a. If there is continuity, replace non-operating clearance light (WP 0227).

b. If there is no continuity, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

Step 15. Remove passenger side light bezel cover (WP 0337). Disconnect passenger side body wire harness clearance light connector at non-operating clearance marker. Check for 22 to 28 VDC between wire 1606 (green) at passenger side body wire harness clearance marker terminal and a know good ground.

If 22 to 28 VDC are present, go to Step 17.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

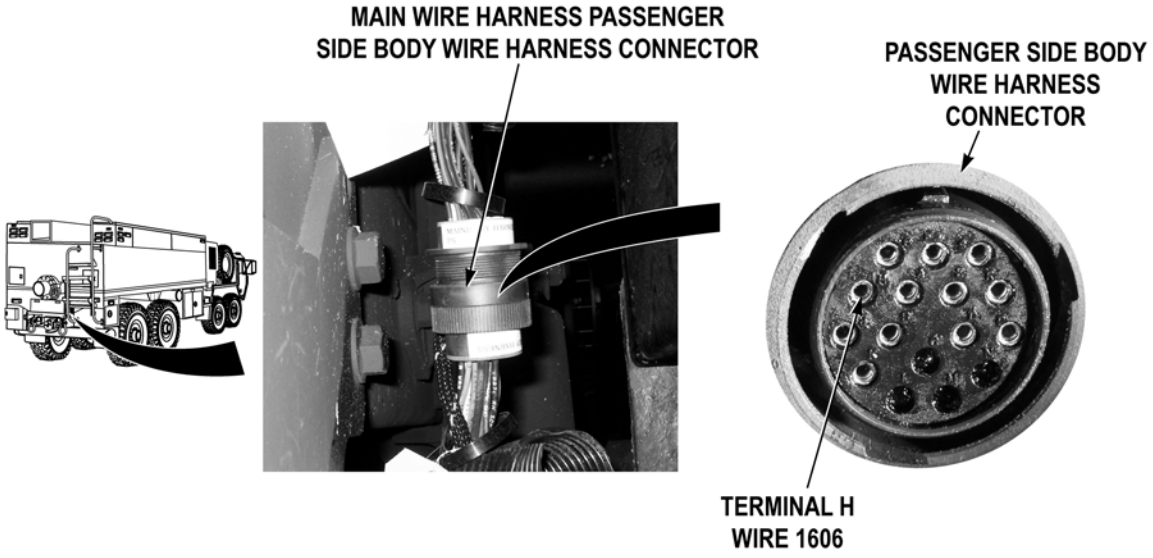
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 16. Turn Off Clearance Lamps (TM 9-2320-279-10). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from main wire harness passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

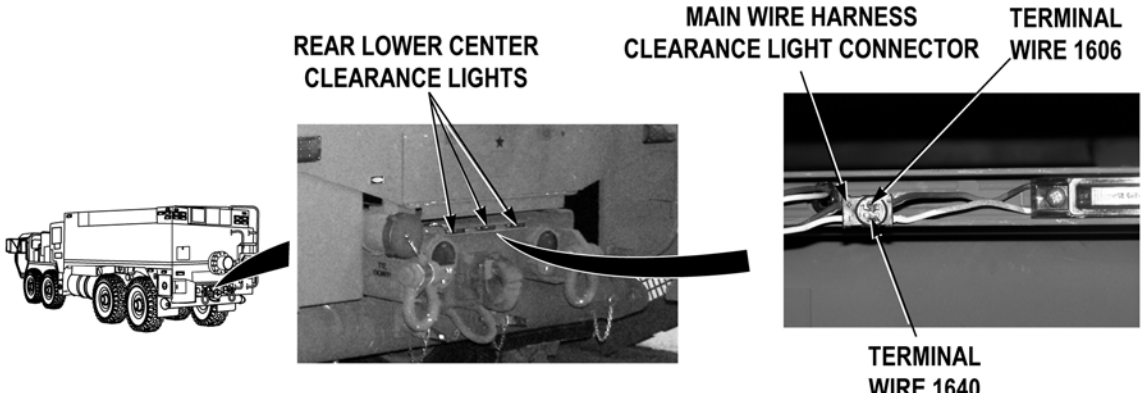
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 17. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for 22 to 28 VDC between wire 1606 (green) at main wire harness passenger side body wire harness connector, terminal H and a known good ground.

a. If 22 to 28 VDC are present, repair wire 1606 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If 22 to 28 VDC are not present, repair wire 1606 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 18. Remove non-operating rear lower center clearance light (WP 0225). With a test lead set, check for 22 to 28 VDC between terminal wire 1606 (black) at main wire harness clearance light connector terminal and a known good ground.

If 22 to 28 VDC are not present, repair wire 1606 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

NOTE

Lower center rear clearance marker LED light assembly must be inserted into connector so + marking on light assembly align with black wire. LED lights will not function if installed in reversed position.

Step 19. Turn Off Clearance Lamps (TM 9-2320-279-10). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a lead test set, check for continuity across main wire harness wire 1640 (white) from main wire harness clearance light connector terminal and a known good ground.

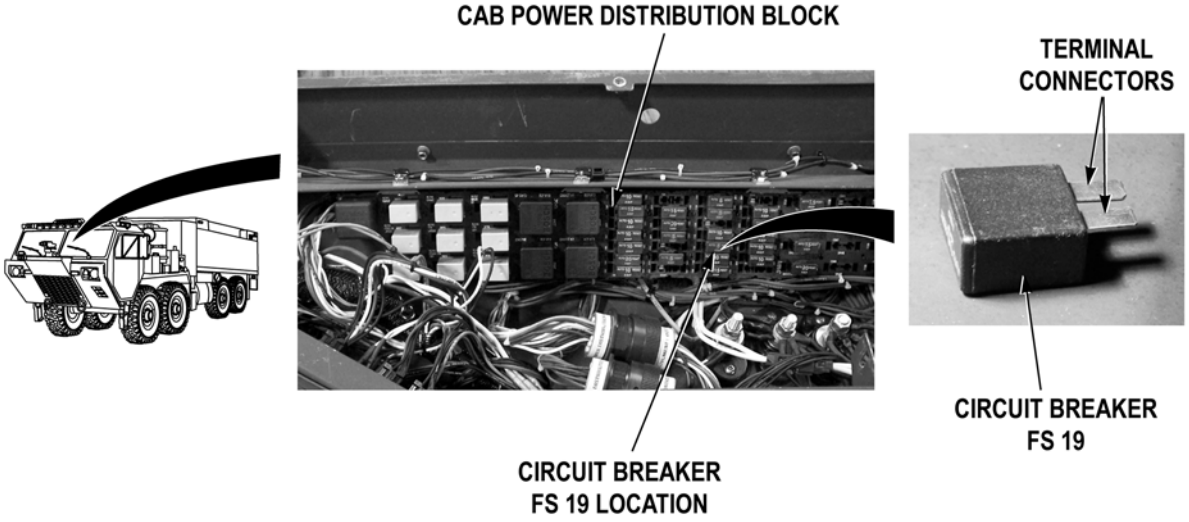
a. If there is continuity, replace non-operating clearance light (WP 0225).

b. If there is no continuity, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 20. Check if clearance lights at side clearance/turn lights operate.

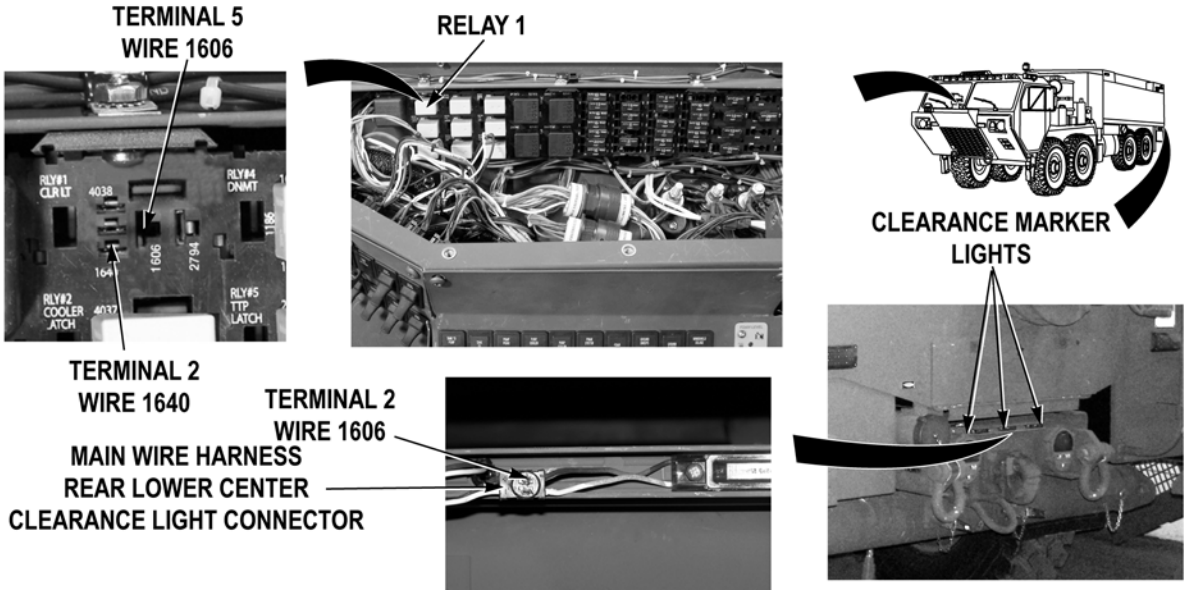
If clearance lights at side clearance/turn lights do not operate, repair wire H012 (white) in cab instrument panel wire harness (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).



Step 21. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 19 (WP 0240). With a test lead set, check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 19 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



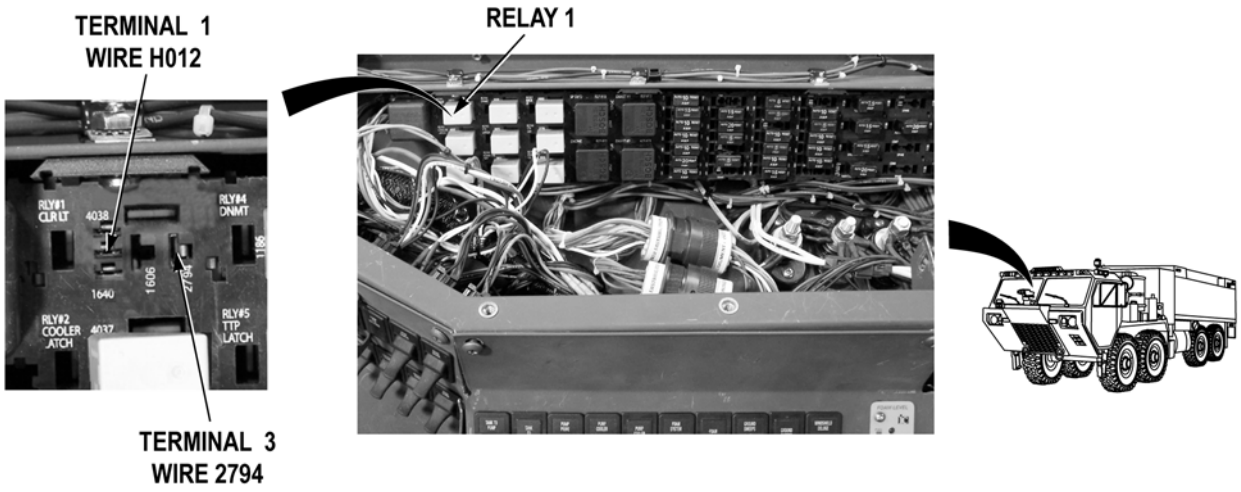
Step 22. Install circuit breaker FS 19 (WP 0240). Remove relay 1 (WP 0242). Remove one rear lower center clearance light (WP 0227). With a test lead set, check for continuity across wire 1606 (green) from cab power distribution block relay 1 connector, terminal 5 to rear lower center clearance light connector terminal.

If there is no continuity, go to Step 27.

Step 23. With a test lead set, check for continuity across cab power distribution wire harness wire 1640 (black) from relay 1 connector, terminal 2 to a known good ground.

If there is no continuity, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 24. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Turn On Clearance Lamps (TM 9-2320-279-10). With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire H012 (white) at relay 1 connector, terminal 1 and a known good ground.

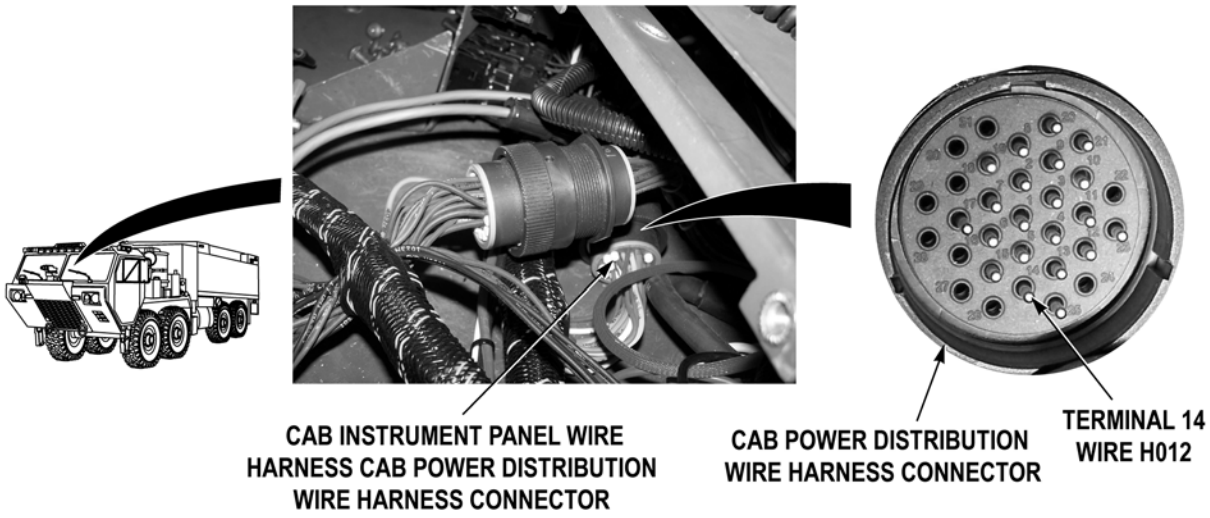
If 22 to 28 VDC are not present, go to Step 26.

Step 25. With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 2794 (red) at relay 1 connector, terminal 3 and a known good ground.

a. If 22 to 28 VDC are present, replace relay 1 (WP 0242).

b. If 22 to 28 VDC are not present, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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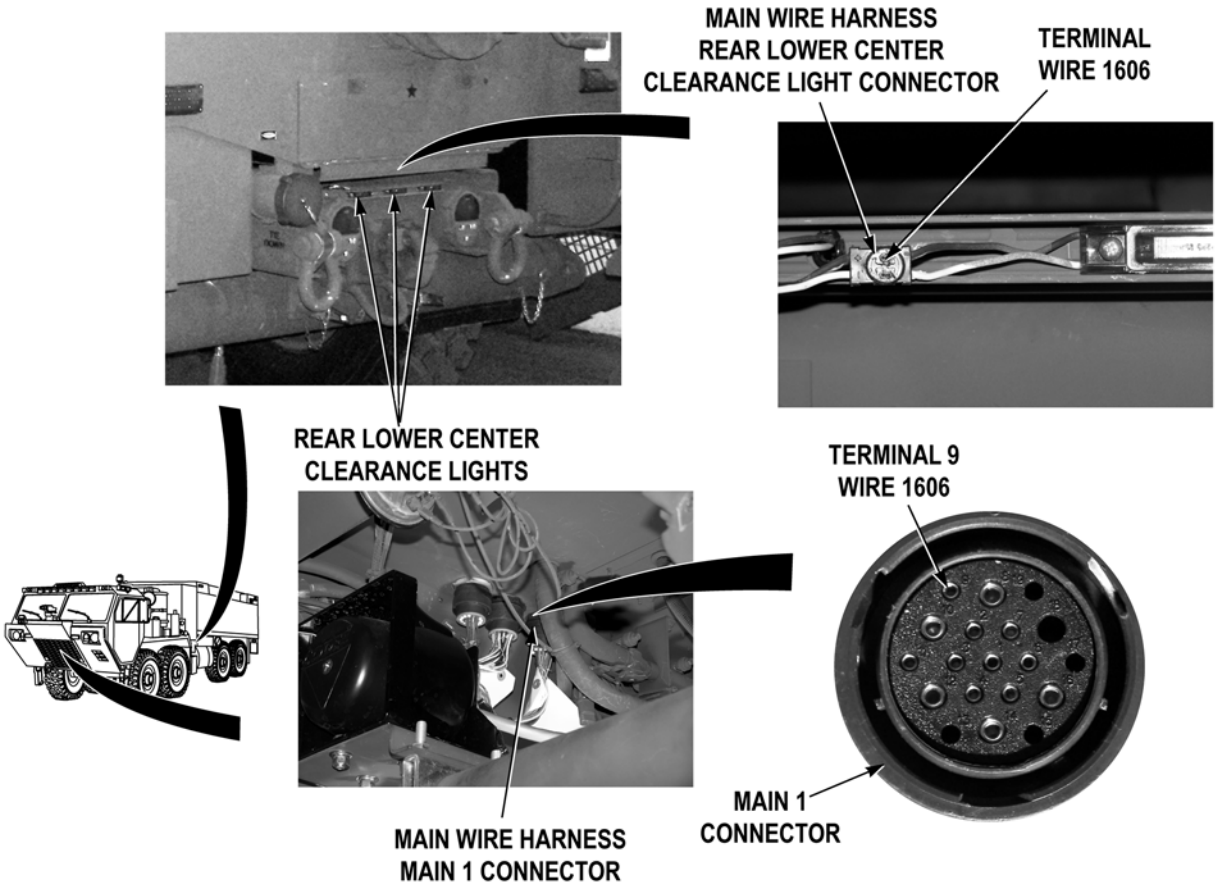
Step 26. Disconnect cab instrument panel wire harness cab power distribution wire harness connector. With a test lead set, check for 22 to 28 VDC between cab instrument panel wire harness wire H012 (white) at cab power distribution wire harness connector, terminal 14 and a known good ground.

a. If 22 to 28 VDC are present, repair wire H012 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If 22 to 28 VDC are not present, repair wire H012 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

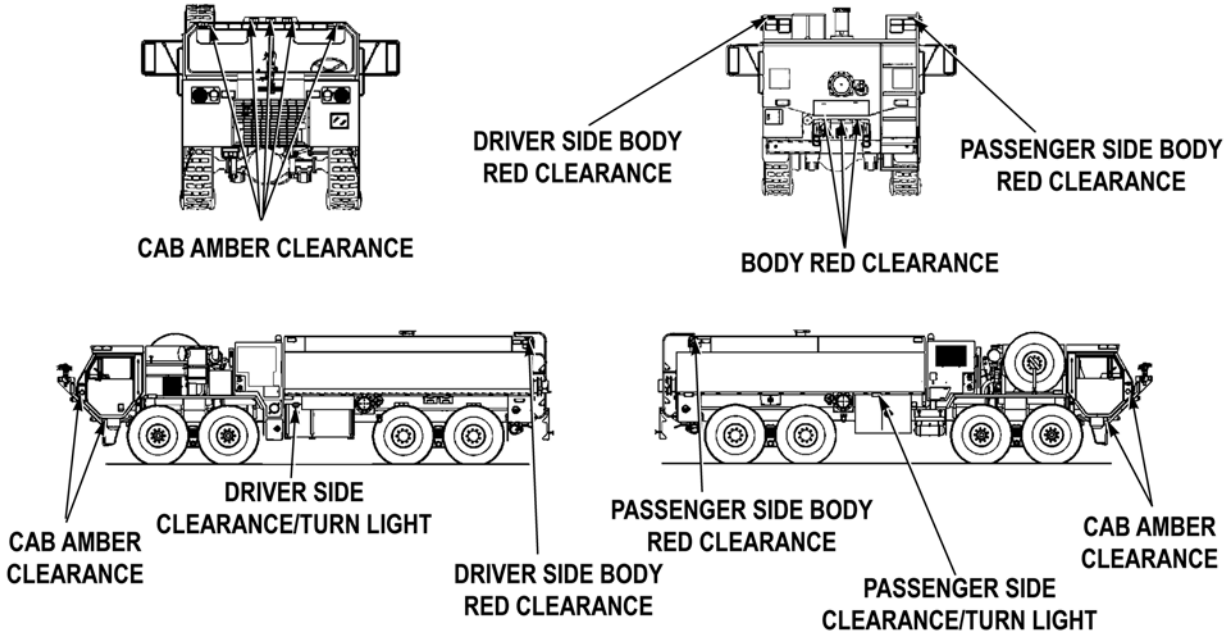


Step 27. Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across wire 1606 (green) from main wire harness main 1 connector, terminal 9 to rear center lower clearance light connector terminal.

a. If there is continuity, repair wire 1606 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1606 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 28. Check if clearance light(s) at side clearance/turn lights operate.

If clearance light(s) at side clearance/turn lights do not operate, go to Step 37.

NOTE

Operation of vehicle with malfunctioning turn signals may violate AR 385-55.

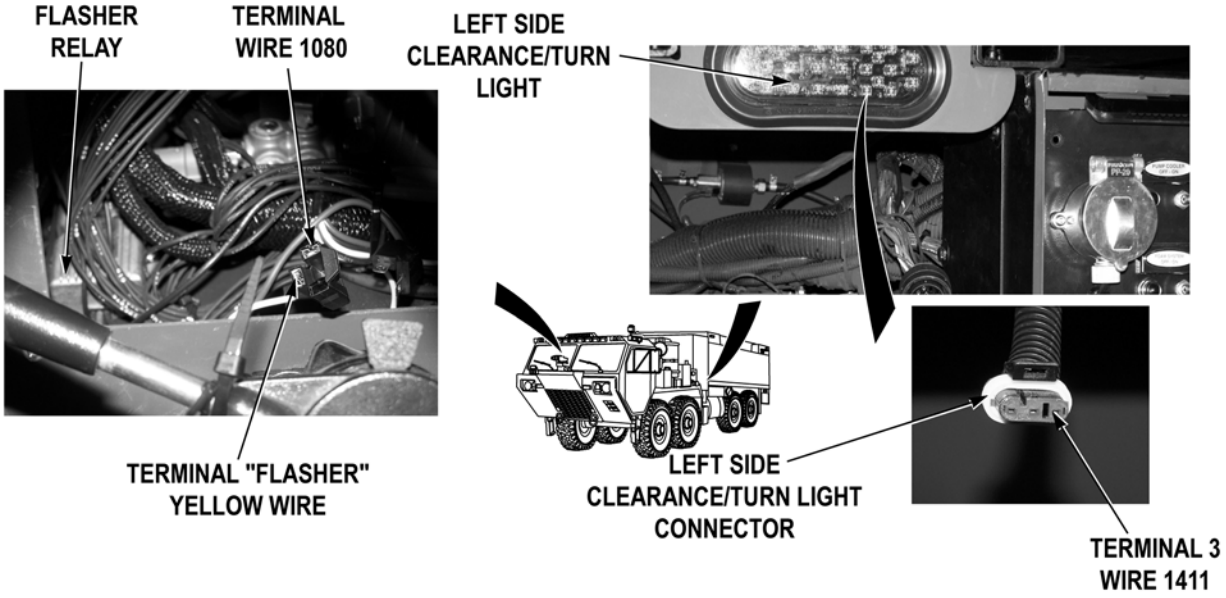
Step 29. Turn Off Clearance Lamps (TM 9-2320-279-10). Turn left turn signal on (TM 9-2320-279-10). Check if left side clearance/turn light flashes.

If left side clearance/turn light flashes, go to Step 33.

Step 30. Check if left front turn light flashes.

If left front turn signal does not flash, troubleshoot Left Front Turn Signal Does Not Operate (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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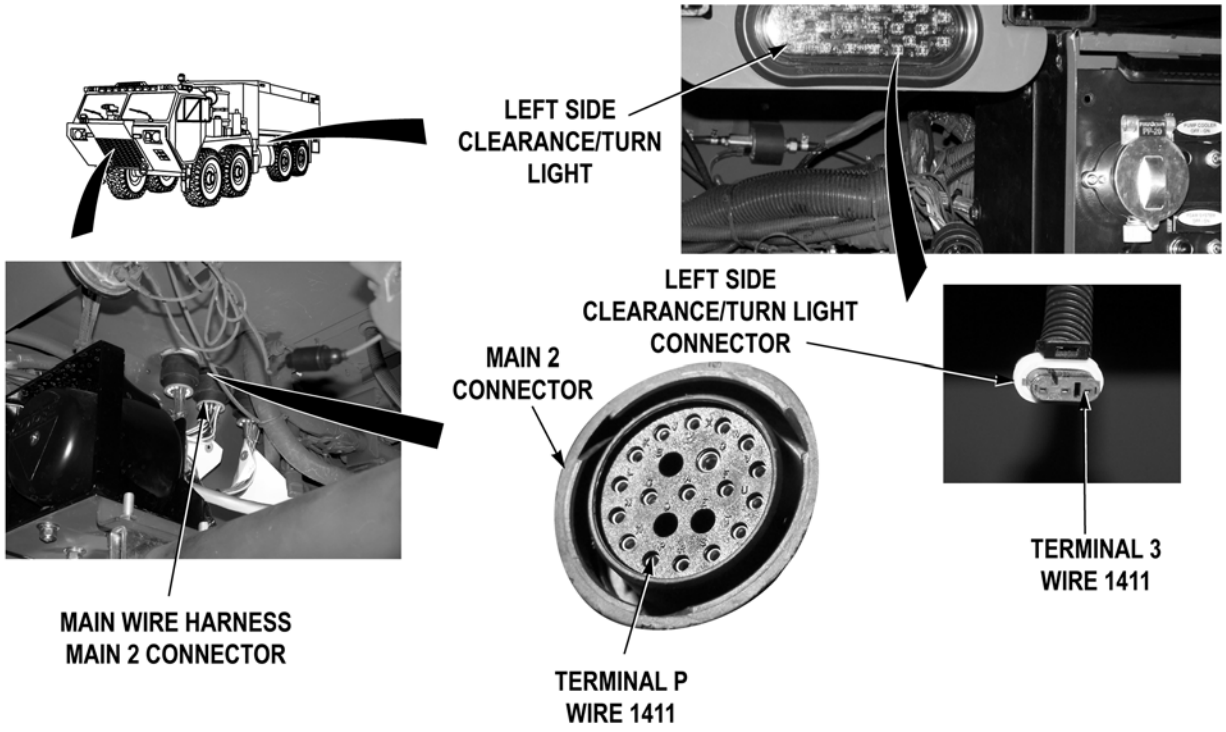
Step 31. Pull battery disconnect switch to off position (WP 0007). Remove six screws holding sunscreen and place instrument panel in service position (TM 9-2320-315-14&P). Remove flasher relay (TM 9-2320-315-14&P). Install a test lead set between cab wire harness flasher relay connector terminals wire 1080 and turn signal 'Flasher' yellow wire. Remove left side clearance/turn light (WP 0226). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Turn left turn signal on (TM 9-2320-315-14&P). With a test lead set, check for 22 to 28 VDC between main wire harness wire 1411 (yellow) at left side clearance/turn light connector, terminal 3 and a known good ground.

If 22 to 28 VDC are present, replace left side clearance/turn light (WP 0226).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

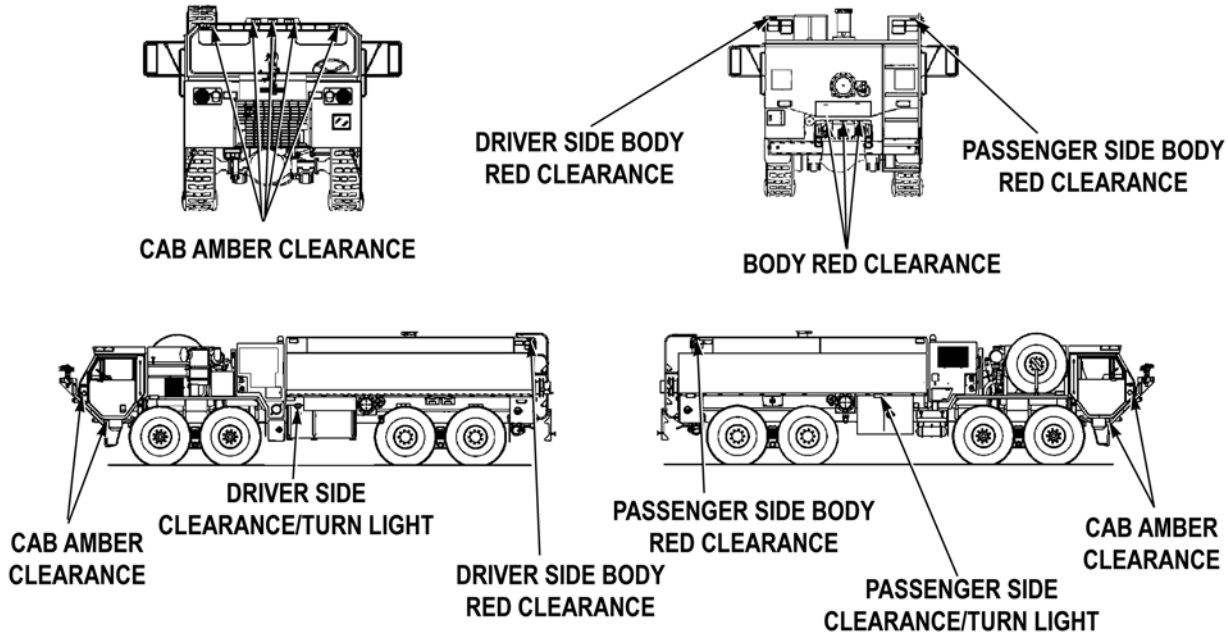


Step 32. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across wire 1411 (yellow) from main wire harness main 2 connector, terminal P to left side clearance/turn connector, terminal 3.

a. If there is continuity, repair wire 1411 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1411 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

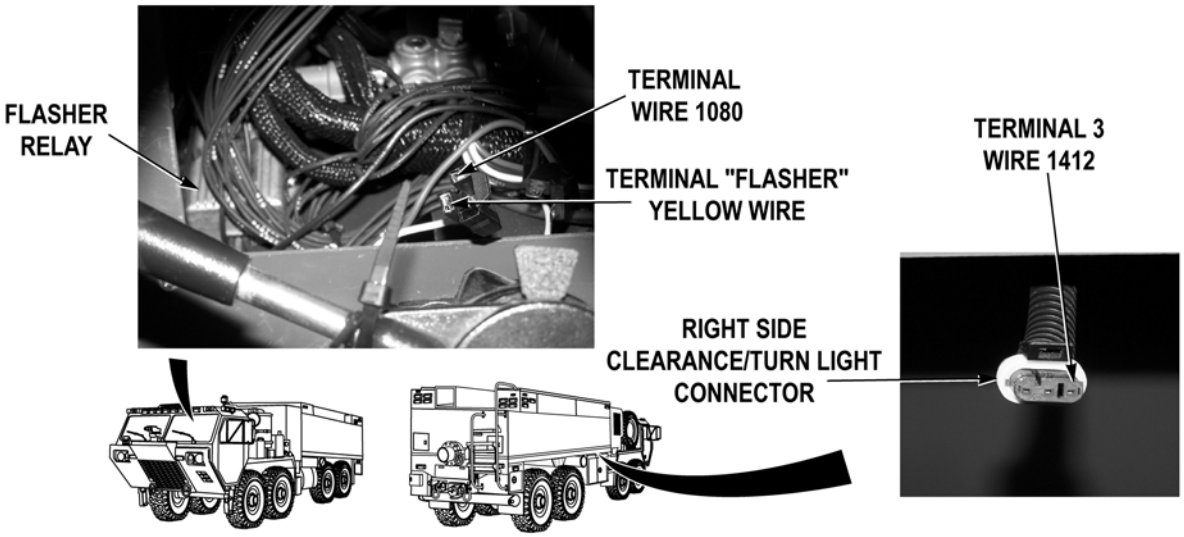
Step 33. Turn right turn signal on (TM 9-2320-279-10). Check if right side clearance/turn light flashes.

If right side clearance/turn light flashes, fault has been corrected.

Step 34. Check if right front turn light flashes.

If right front turn light does not flash, troubleshoot Right Front Turn Signal Does Not Operate (TM 9-2320-315-14&P).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



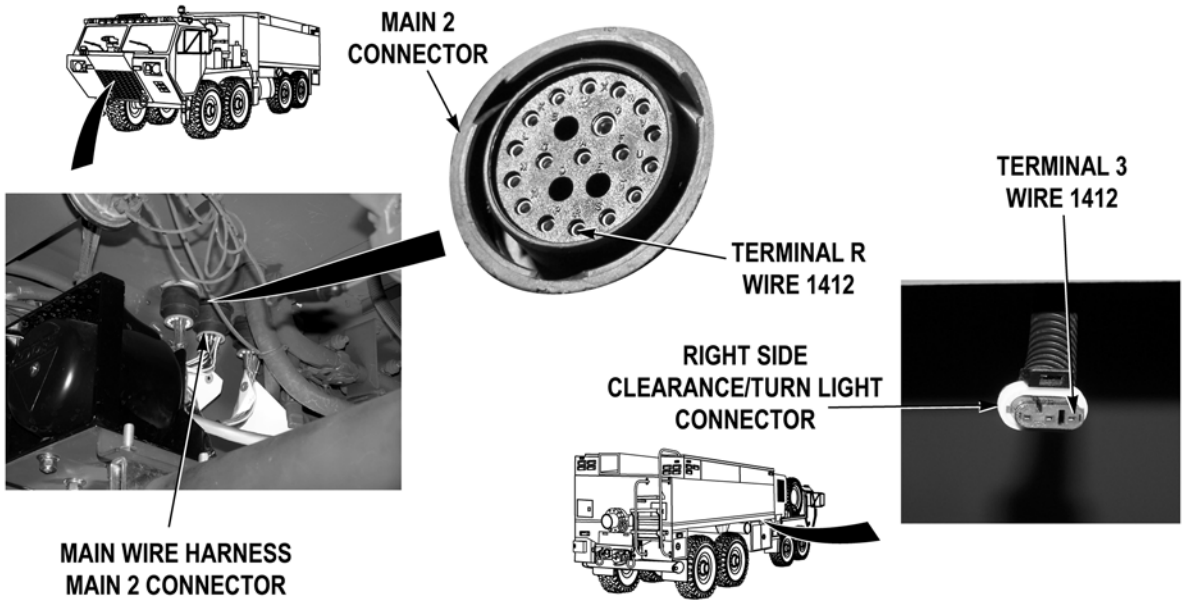
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 35. Pull battery disconnect switch to off position (WP 0007). Remove six screws holding sunscreen, and place instrument panel in service position (TM 9-2320-315-14&P). Remove flasher relay (TM 9-2320-315-14&P). Install test lead set between cab wire harness flasher relay connector terminals wire 1080 and turn signal “Flasher” yellow wire. Disconnect main wire harness from right side clearance/turn light connector (WP 0226). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Turn right turn signal on (TM 9-2320-279-10). With a test lead set, check for 22 to 28 VDC between main wire harness wire 1412 (green) at right side clearance/turn light connector, terminal 3 and a known good ground.

If 22 to 28 VDC are present, replace right side clearance/turn light (WP 0226).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

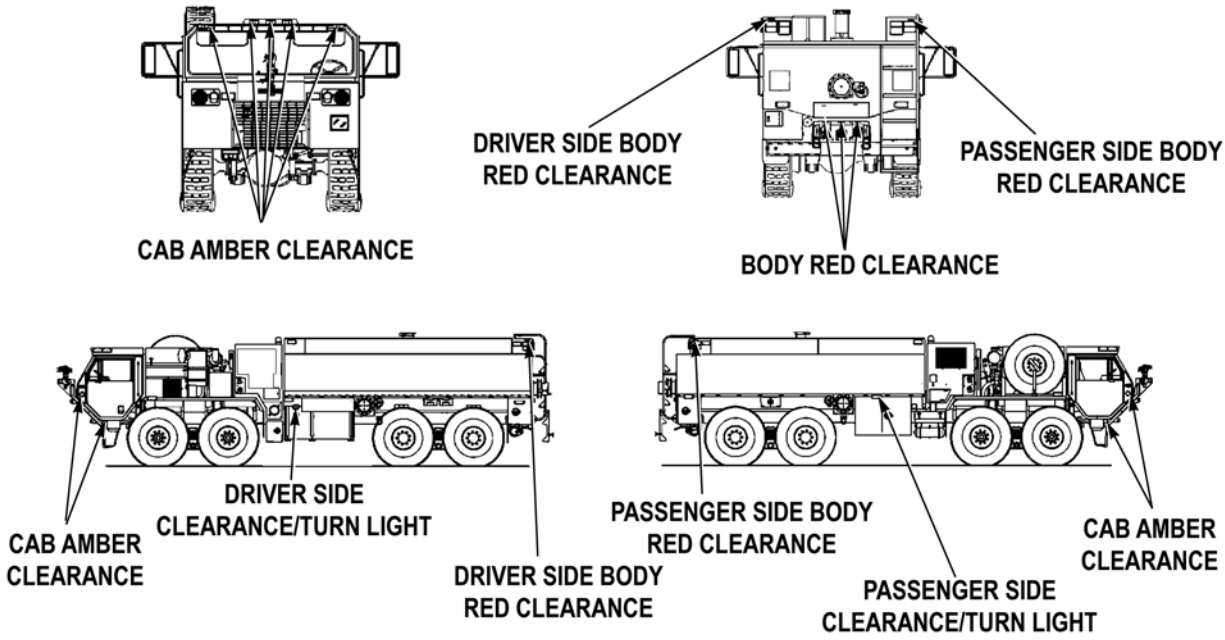


Step 36. Remove skid plate grille (WP 0350). Pull battery disconnect switch to off position (WP 0293). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across wire 1412 (green) from main wire harness main 2 connector, terminal R to right side clearance/turn connector terminal 3.

a. If there is continuity, repair wire 1412 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

b. If there is no continuity, repair wire 1412 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



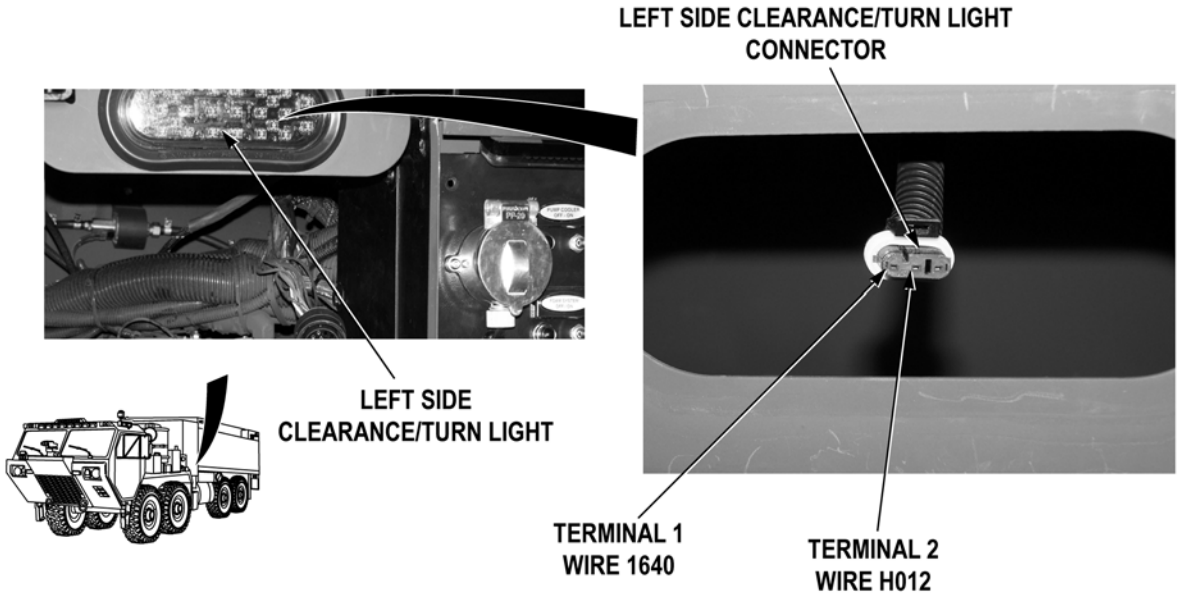
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 37. Check if at least one clearance light(s) at side clearance/turn lights operate.

If both clearance lights at side clearance/turn lights do not operate, go to Step 40.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 38. Disconnect main wire harness from non-operating side clearance/turn light connector (WP 0226). With a test lead set, check for 22 to 28 VDC between wire H012 (white) at main wire harness side clearance/turn light connector, terminal 2 and a known good ground.

If 22 to 28 VDC are not present, repair wire H012 in main wire harness (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 39. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across main wire harness wire 1640 (black) from main wire harness side clearance/turn light connector, terminal 1 and a known good ground.

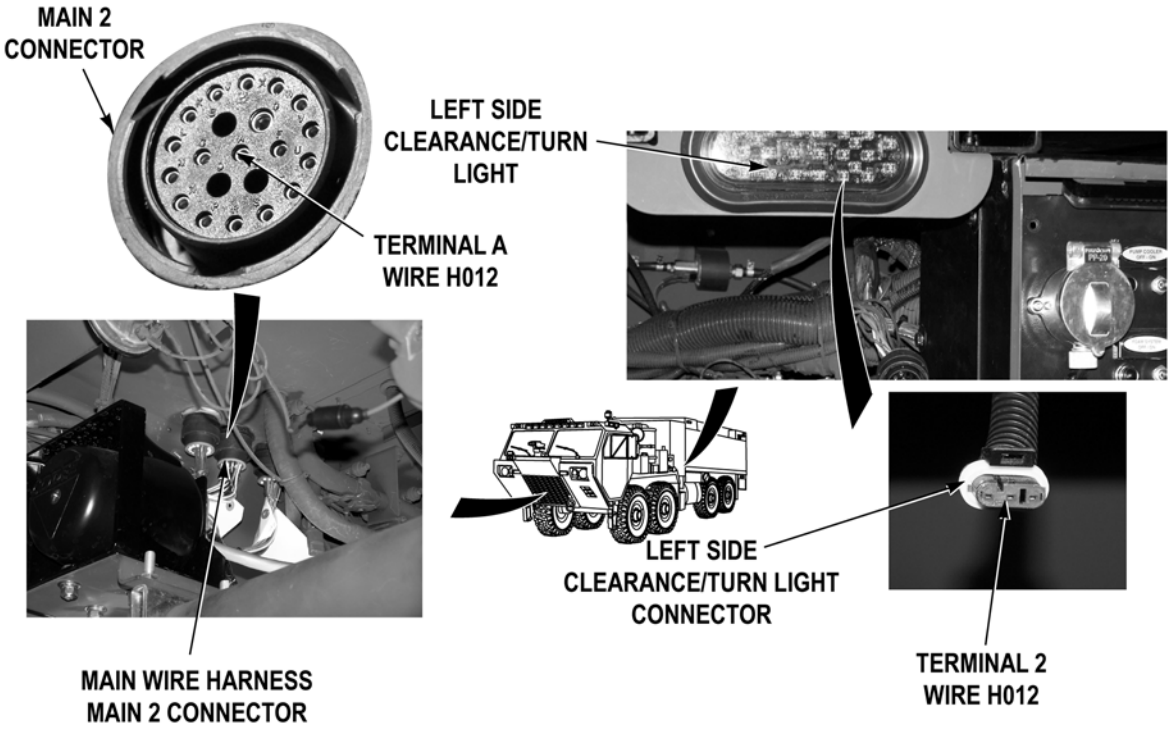
a. If there is continuity, replace non-operating side clearance/turn light (WP 0226).

b. If there is no continuity, repair wire 1640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 40. Remove one non-operating side clearance/turn light (WP 0226). With a test lead set, check for 22 to 28 VDC between wire H012 (white) at main wire harness side clearance/turn light connector, terminal 2 and a known good ground.

If 22 to 28 VDC are present, repair wire 1640 if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 41. Remove skid plate grille (WP 0350). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to on position (WP 0007). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across wire H012 (white) from main wire harness main 2 connector, terminal A to side clearance/turn light connector, terminal 2.

a. If there is continuity, repair wire H012 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire H012 in cab instrument panel wire harness if repairable (TM 9-2320-315-14&P), or replace cab instrument panel wire harness (WP 0279).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

DRIVER SIDE STOWAGE COMPARTMENT STRIPLIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

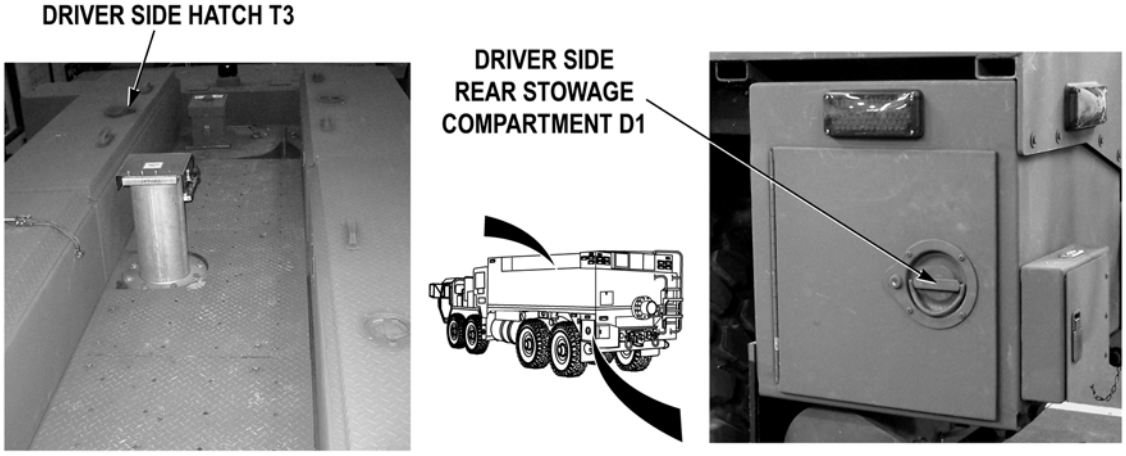
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0100
WP 0203

References (continued)
WP 0213
WP 0240
WP 0245
WP 0280
WP 0287
WP 0293

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

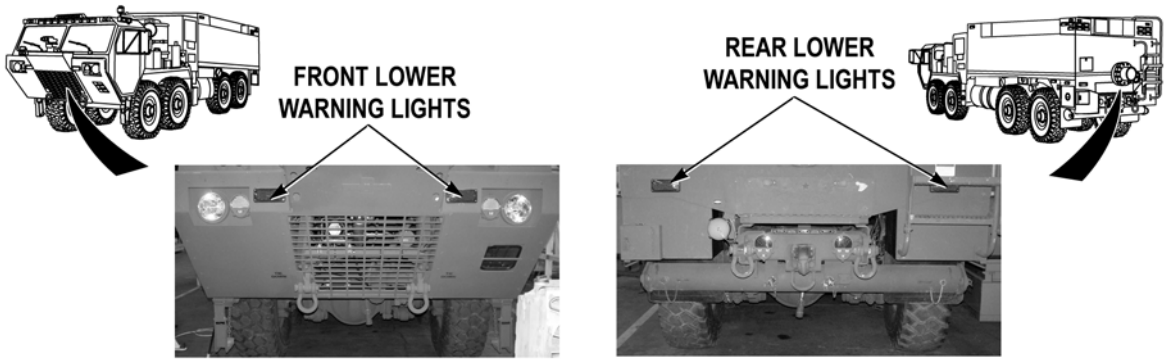
DRIVER SIDE STOWAGE COMPARTMENT STRIPLIGHT(S) DOES NOT OPERATE



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Open all driver side compartment doors and hatches (WP 0008). Check if at least one driver side stowage compartment striplight operates.

If at least one driver side stowage compartment striplight operates, go to Step 8.

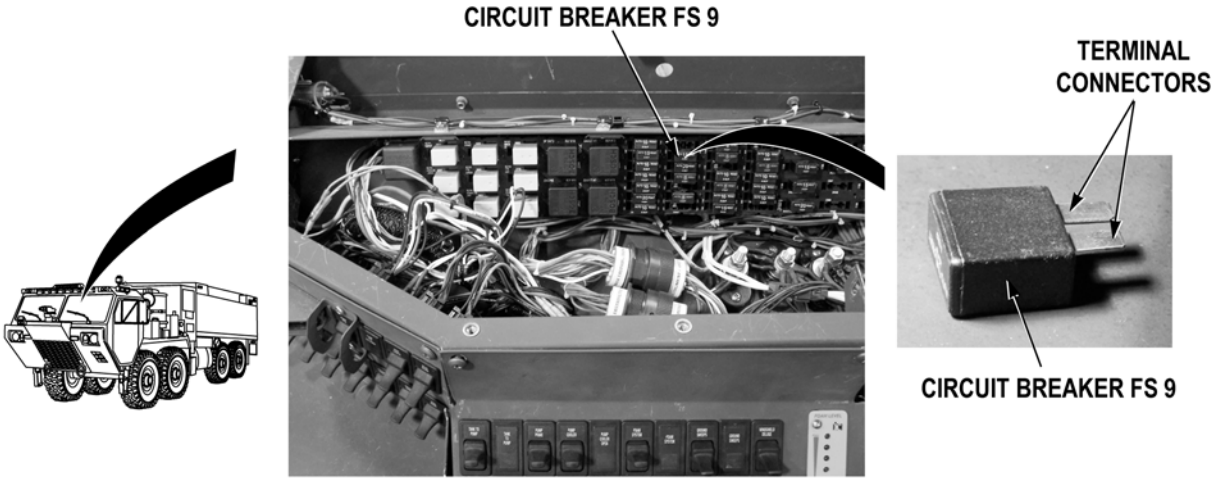
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if front and rear warning lights operate.

If front and rear warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0100).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Put EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 9 (WP 0240). Check for continuity across circuit breaker.

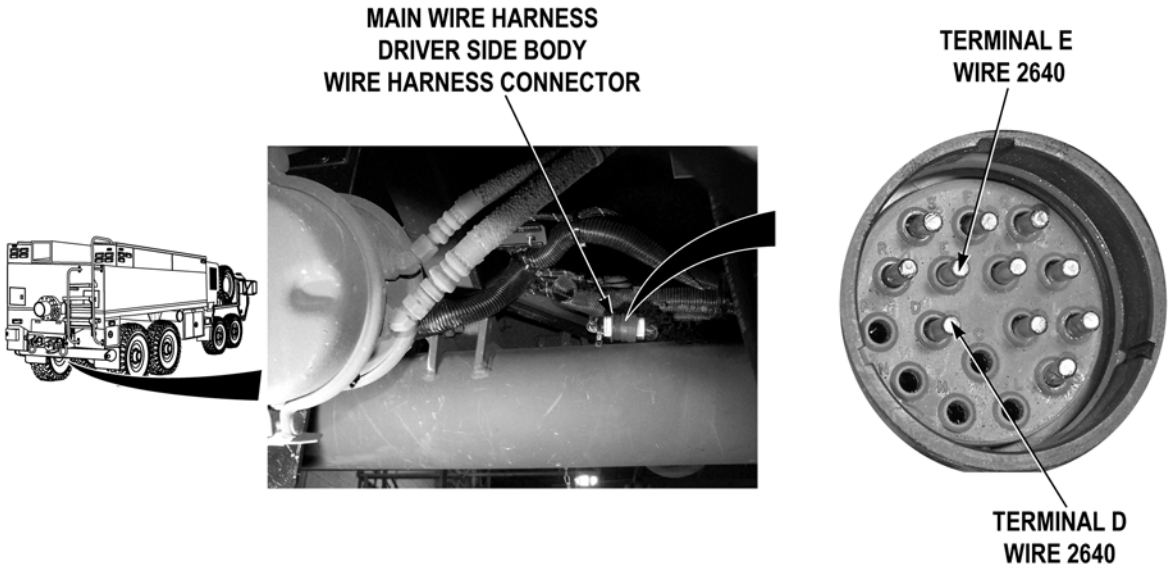
If there is no continuity, replace circuit breaker FS 9 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 4. Install circuit breaker FS 9 (WP 0240). Disconnect main wire harness driver side body wire harness connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). With a test lead set, check for 22 to 28 VDC between wire 1188 (red) at main wire harness driver side body wire harness connector, terminal J and a known good ground.

If 22 to 28 VDC are not present, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



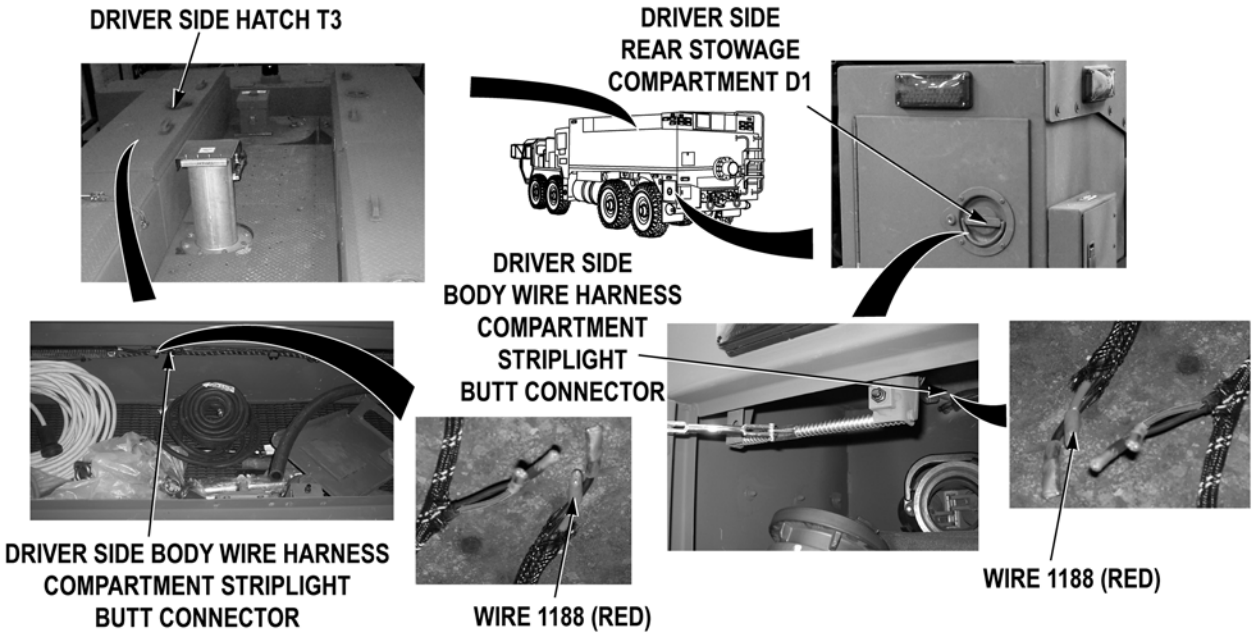
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across main wire harness wire 2640 (black) from driver side body wire harness connector, terminals D and E to a known good ground.

If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

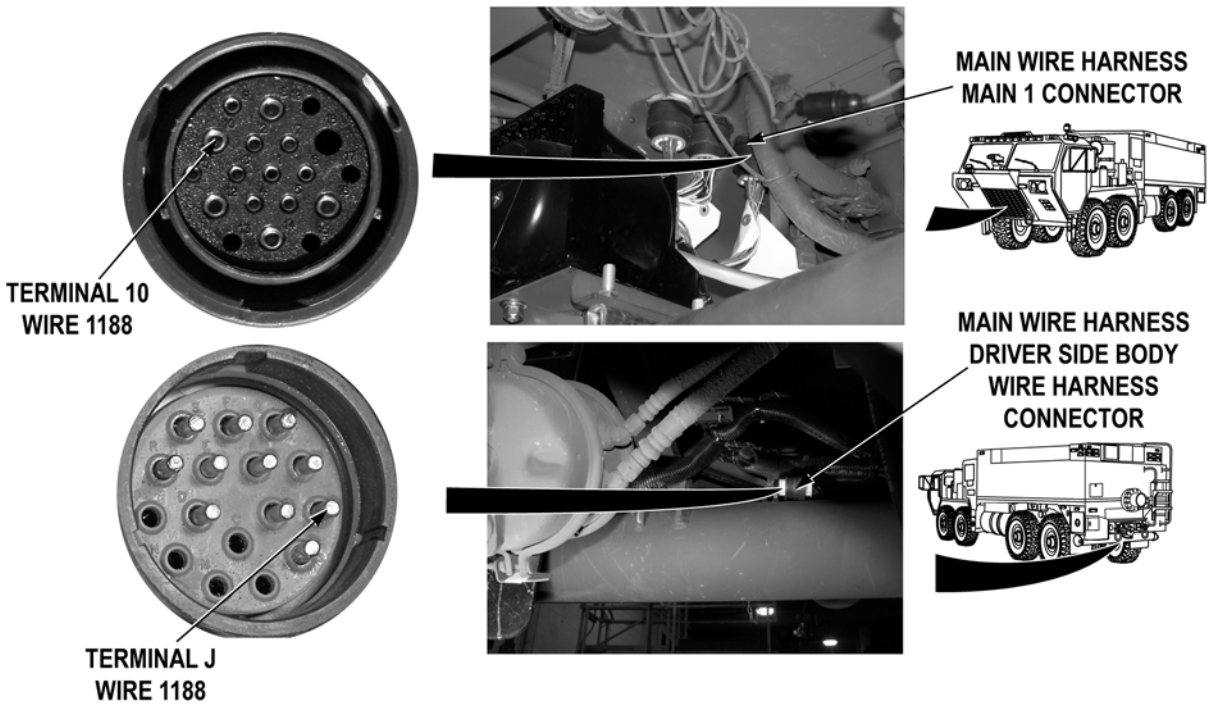


Step 6. Connect main wire harness driver side body wire harness connector. Cut driver side body wire harness stowage compartment striplight butt splice connector wire 1188 (red). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between wire 1188 (red) at driver side body wire harness stowage compartment striplight connector and a known good ground.

a. If 22 to 28 VDC are present, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If 22 to 28 VDC are not present, repair wire 1188 in driver side body harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

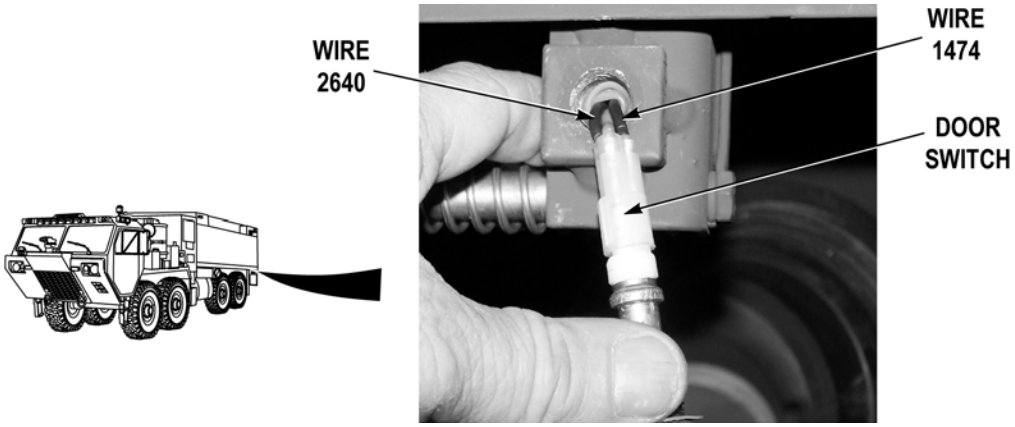
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 7. Remove skid plate grille (WP 0350). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 1 connector. With a lead test set, check for continuity across main wire harness wire 1188 (red) from main wire harness main 1 connector, terminal 10 to driver side body wire harness connector, terminal J.

a. If there is continuity, repair wire 1188 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1188 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

NOTE

- If more than one stowage compartment striplight is not operating, perform the following Steps at non-operating stowage compartment striplight.
- Wires 1473 and 1474 are troubleshot the same way. Wire 1473 is located at rear driver side compartment, and wire 1474 is located at driver side hatch.
- If wire 1473 or 1474 cannot be identified at door switch, measure continuity across both black wire terminals to ground. Continuity should be measured between all terminals, when switch is closed (door switch is not pressed).

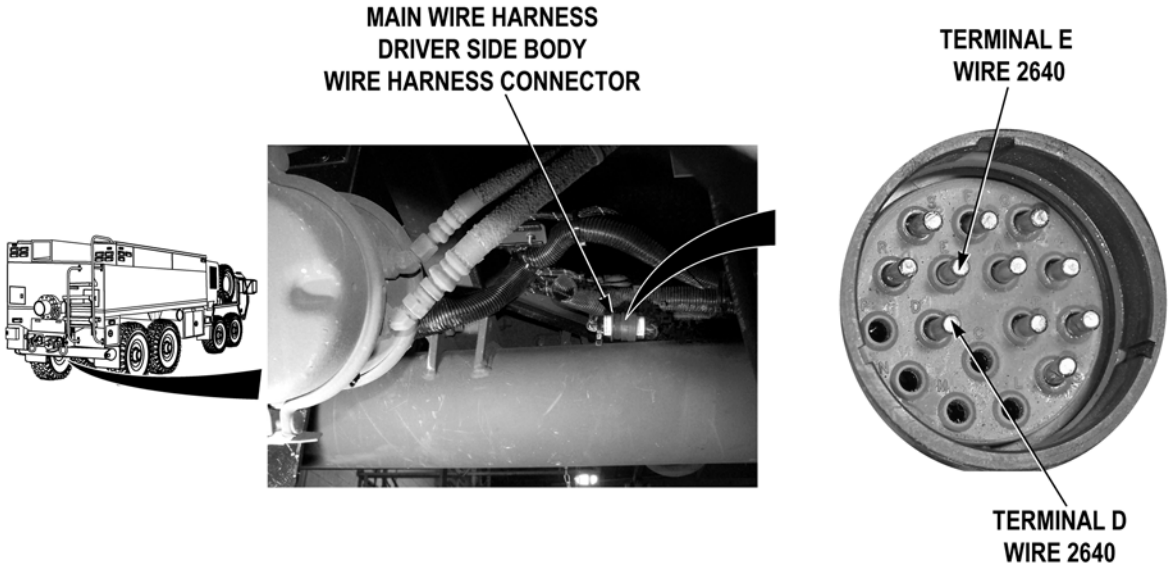
Step 8. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Close all rear doors and hatches except door/hatch associated with non-operating stowage compartment striplight (WP 0008). Remove door switch associated with non-operating stowage compartment striplight (WP 0245). Do not disconnect wires. With a lead test set, check for continuity between door switch terminal wire 1473 or 1474 (black) and a known good ground when switch is closed (door switch is not pressed).

If there is continuity, go to Step 11.

Step 9. Check for continuity across door switch between terminal wire 1473 or 1474 (black) and terminal wire 2640 (black).

If there is no continuity, replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

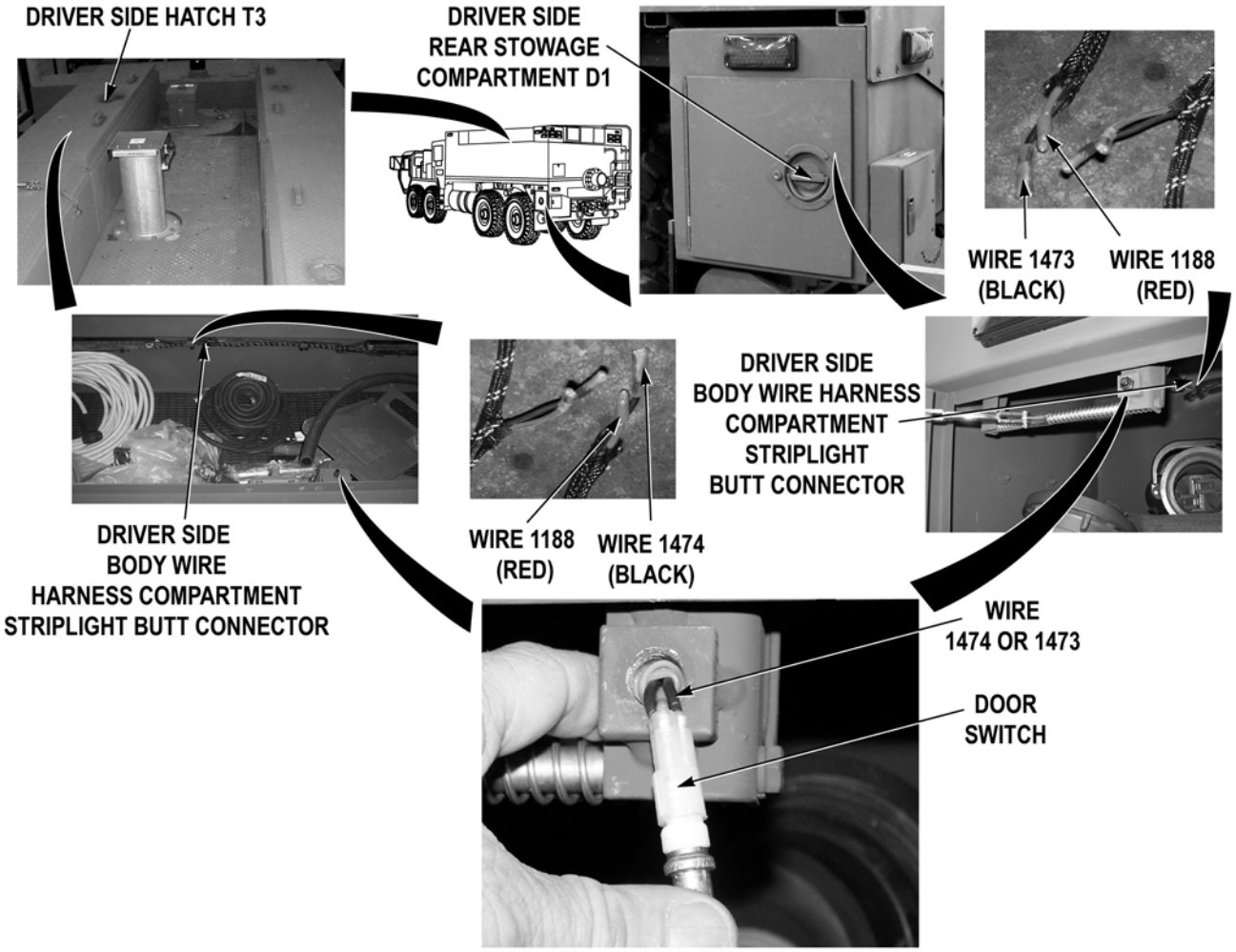


Step 10. Disconnect main wire harness driver side body wire harness connector. With a lead test set, check for continuity across main wire harness wire 2640 (black) from driver side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 11. Remove non-operating stowage compartment striplight (WP 0213). Cut driver side body wire harness stowage compartment striplight butt slice connector wire 1473 or 1474 (black) at splice. Check for continuity across driver side body wire harness wire 1473 or 1474 (black) from stowage compartment striplight connector to associated door switch connector.

If there is no continuity, repair wire 1473 or 1474 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

Step 12. Cut driver side body wire harness stowage compartment striplight butt splice connector wire 1188 (red). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between wire 1188 (red) at driver side body wire harness stowage compartment striplight butt splice connector and a known good ground.

a. If 22 to 28 VDC are present, replace non-operating stowage compartment striplight (WP 0213).

b. If 22 to 28 VDC are not present, repair wire 1188 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

TWO-WAY RADIO DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

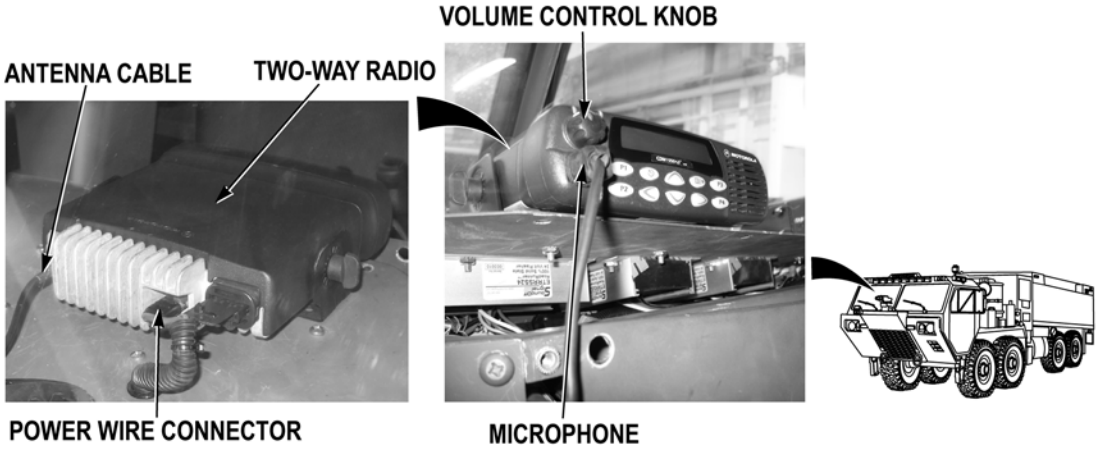
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0117

References (continued)
WP 0203
WP 0234
WP 0250
WP 0254
WP 0273
WP 0275

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

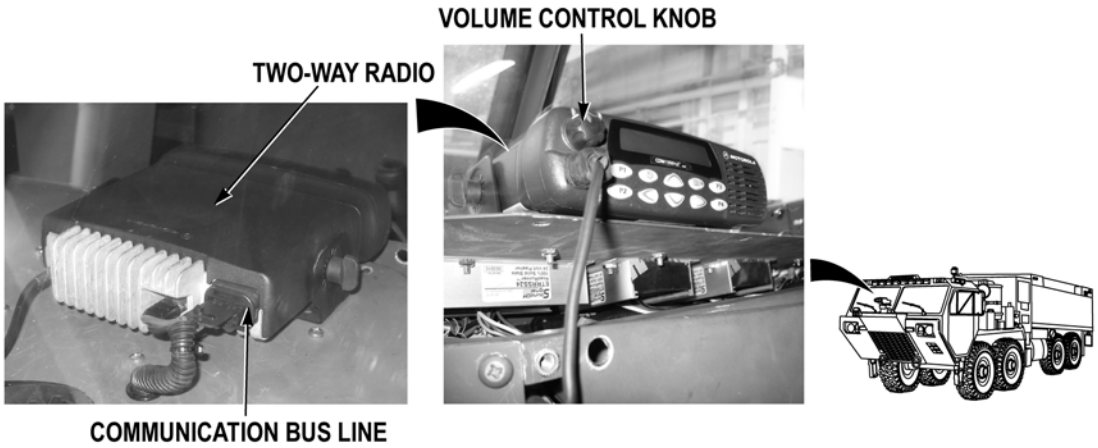
TWO-WAY RADIO DOES NOT OPERATE PROPERLY



Step 1. Check if two-way radio antenna cable, power wire connector, and microphone are connected to two-way radio.

If two-way radio antenna cable, power wire connector, and microphone are not connected, connect disconnected connector (WP 0275).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Two-way radio is turned on by pressing and releasing volume control knob.

Step 2. Push battery disconnect switch to on position (WP 0007). Push two-way radio volume control knob to on position (WP 0004). Check if two-way radio display illuminates.

If two-way radio display does not illuminate, go to Step 5.

NOTE

Two-way radio will enter into a self test mode after power up. If power up self test is successful, you will hear two high pitch tones. If two-way radio fails to power up, you will hear a single low pitch tone.

Step 3. Push two-way radio volume control knob to off position (WP 0004). Turn two-way radio volume control knob clockwise to full volume position (WP 0004). Push two-way radio volume control knob to on position (WP 0004). Check for audible two-way radio self test tones.

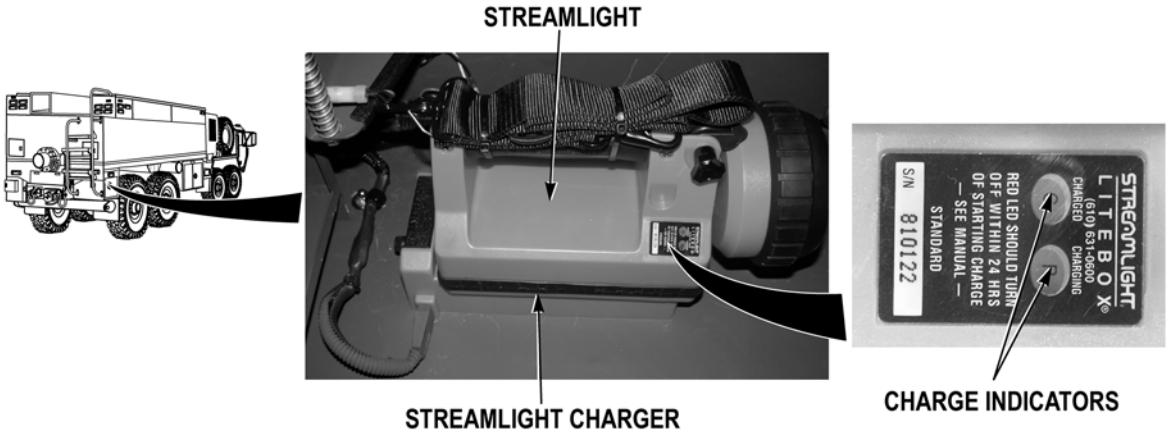
If two-way radio transmits a single low pitch tone, replace two-way radio (WP 0275).

Step 4. Disconnect communication bus line between two-way radio and intercom controller (WP 0275). Using two-way radio microphone, check if two-way radio transmits and receives to and from a handheld radio.

a. If two-way radio does not operate properly, replace two-way radio (WP 0275).

b. If two-way radio operates properly, troubleshoot Intercom and Headsets Do Not Operate Properly (WP 0117).

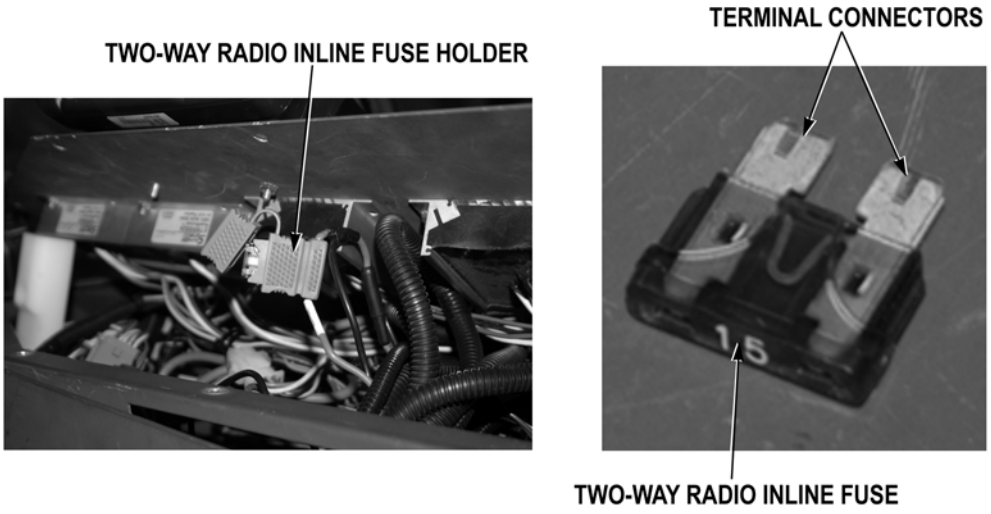
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 5. Open passenger side stowage compartment P1 door (WP 0008). With streamlight securely fastened in streamlight charge, check if streamlight charge indicators illuminate (WP 0004).

If streamlight charge indicators do not illuminate, go to Step 9.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



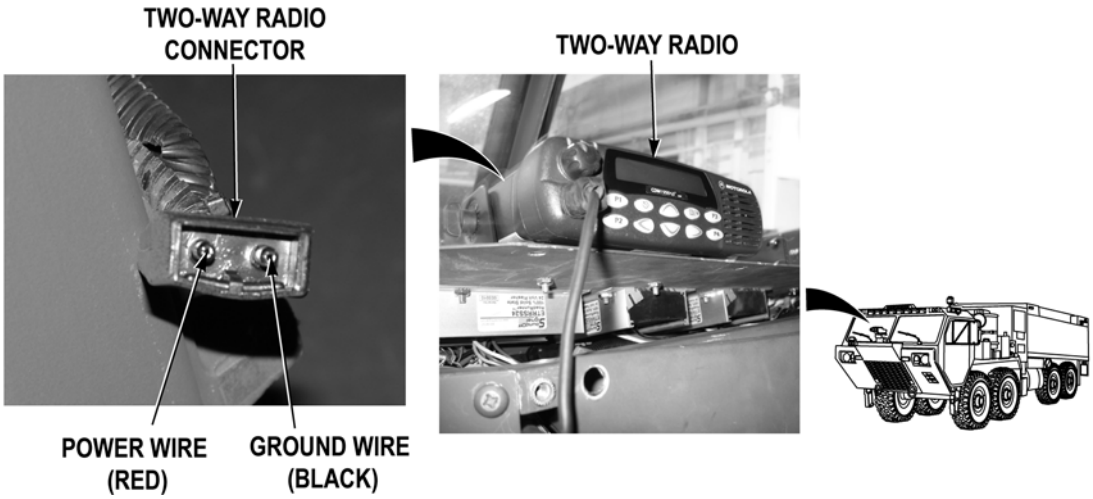
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 6. Pull battery disconnect switch to off position (WP 0007). Remove instrument panel A (WP 0203). Remove two-way radio inline fuse (WP 0254). Check for continuity across fuse.

If there is no continuity across fuse, replace fuse (WP 0254).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 7. Install two-way radio inline fuse (WP 0254). Disconnect two-way radio connector from two-way radio (WP 0275). Push battery disconnect switch to on position (WP 0007). Check for 12 to 14 VDC between two-way radio power wire (red) connector and a known good ground.

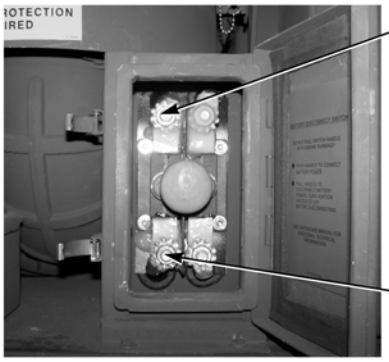
If 12 to 14 VDC are not present, repair two-way radio power wire if repairable (TM 9-2320-315-14&P), or replace two-way radio (WP 0275).

Step 8. Pull battery disconnect switch to off position (WP 0007). Check for continuity across two-way radio ground wire (black) from radio connector to a know good ground.

a. If there is continuity, replace two-way radio (WP 0275).

b. If there is no continuity, repair two-way radio ground wire if repairable (TM 9-2320-315-14&P), or replace two-way radio (WP 0275).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



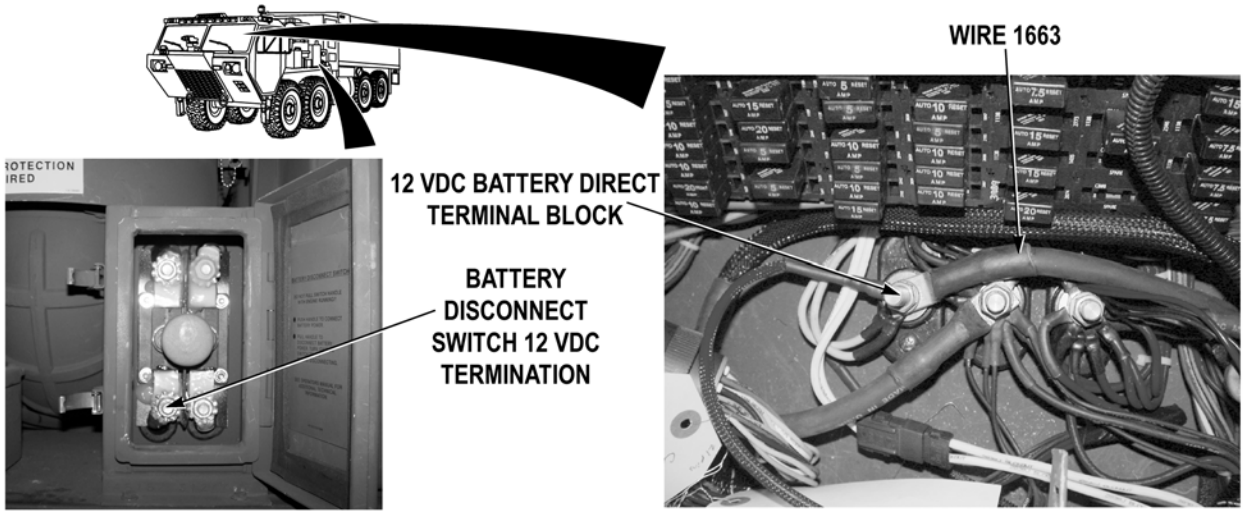
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 9. Disconnect batteries (TM 9-2320-315-14&P). Check battery disconnect switch 12 VDC terminations for loose and corroded connections.

If connections are loose or corroded, clean and/or tighten connections or replace battery disconnect switch (WP 0234).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. With test lead set, check for continuity across high amperage wire 1663 (black) from battery disconnect switch 12 VDC termination to 12 VDC cab battery direct terminal block.

a. If there is continuity, replace 12 VDC cab battery direct terminal block (WP 0273).

b. If there is no continuity, repair wire 1663 if repairable (TM 9-2320-315-14&P), or replace high amperage cable (WP 0250).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

INTERCOM AND HEADSETS DO NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Test Lead Set (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

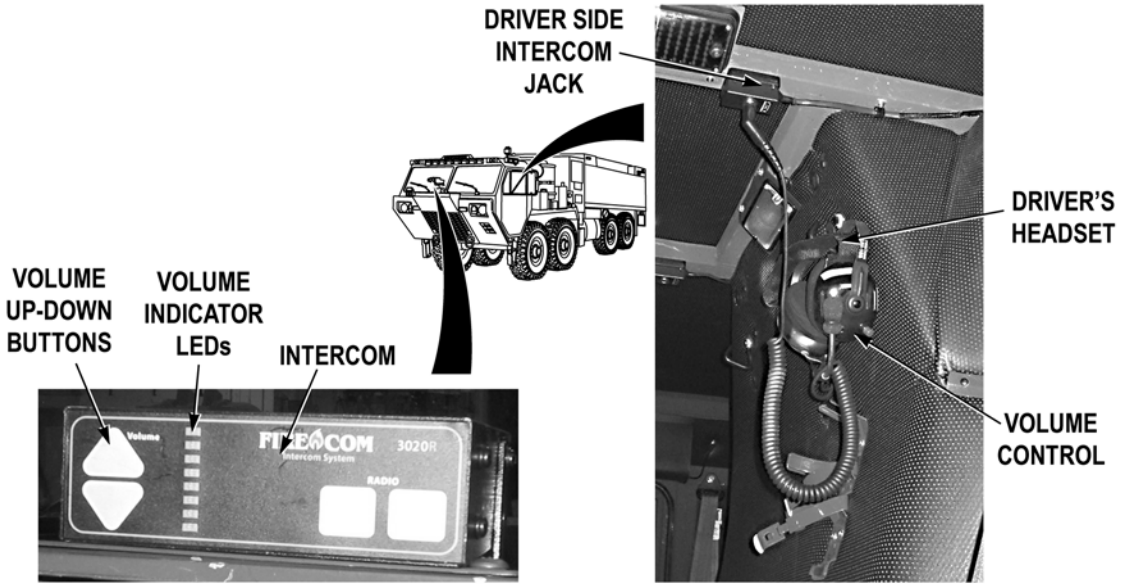
References
TM 9-2320-315-14&P
TM 11-5820-890-10
WP 0004
WP 0007

References (continued)
WP 0010
WP 0255
WP 0256
WP 0275
WP 0290

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

INTERCOM AND HEADSETS DO NOT OPERATE PROPERLY



⚠ CAUTION

Excessive intercom volume may be present. If volume is excessive, adjust headset volume control as required for safe usage. Failure to comply may result in damage to hearing.

Step 1. Push battery disconnect switch to on position (WP 0007). Check if at least one intercom volume indicator LEDs illuminate (WP 0004).

If volume indicator LEDs do not illuminate, go to Step 41.

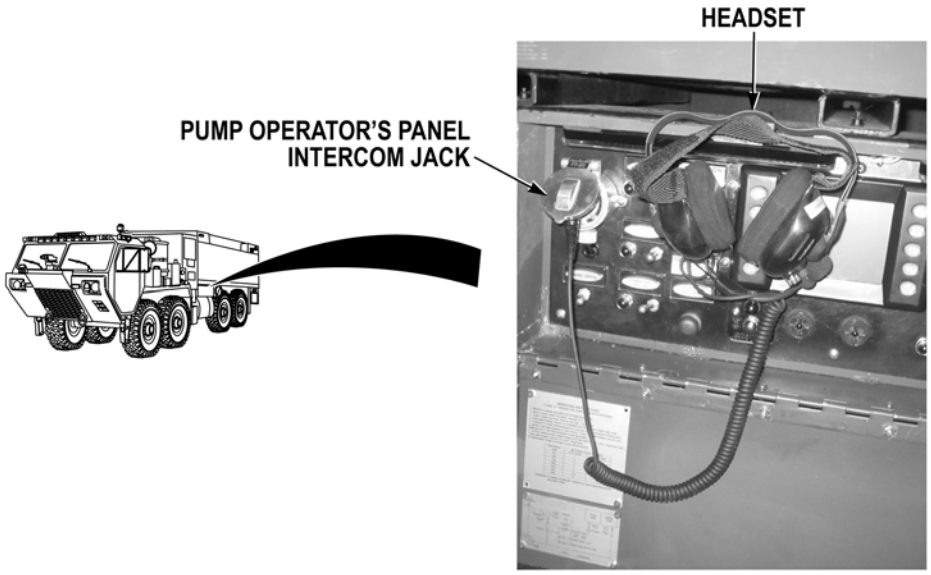
NOTE

- When connecting headset into intercom jack, ensure headset connector is completely inserted into headset jack.
- Driver's headset (Model UH-10S) has one earphone.

Step 2. Press intercom volume up and down buttons until four volume indicator LEDs are illuminated (WP 0004). Connect driver's headset into driver side intercom jack (WP 0004). Put on headset and adjust for comfortable fit. Set headset volume control to low volume (counterclockwise) (WP 0004). While talking into headset microphone, (do not press push-to-talk button), check if headset microphone can be heard through headset earphone.

If driver's headset microphone can be heard through headset earphone, go to Step 4.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

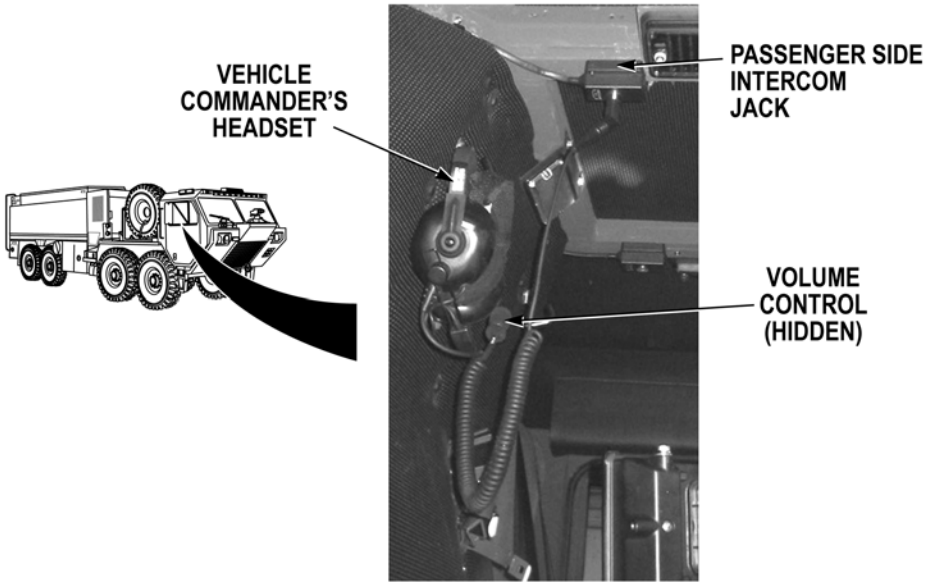


Step 3. Disconnect driver's headset from driver side intercom jack (WP 0004). Open pump operator's panel cover (WP 0010). Connect driver's headset into pump operator's panel intercom jack (WP 0004). While talking into headset microphone, (do not press push-to-talk button), check if driver's headset microphone can be heard through headset earphone.

a. If driver's headset microphone can be heard through headset earphone, go to Step 6.

b. If driver's headset microphone cannot be heard through headset earphone, replace driver's headset.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

When connecting headset into intercom jack, ensure headset connector is completely inserted in headset jack.

Step 4. Connect vehicle commander's headset into passenger side intercom jack (WP 0004). Put on headset and adjust for comfortable fit. Set headset volume control to low volume (counterclockwise) (WP 0004). While talking into headset microphone, (do not press push-to-talk button), check if vehicle commander's headset microphone can be heard through both headset earphones.

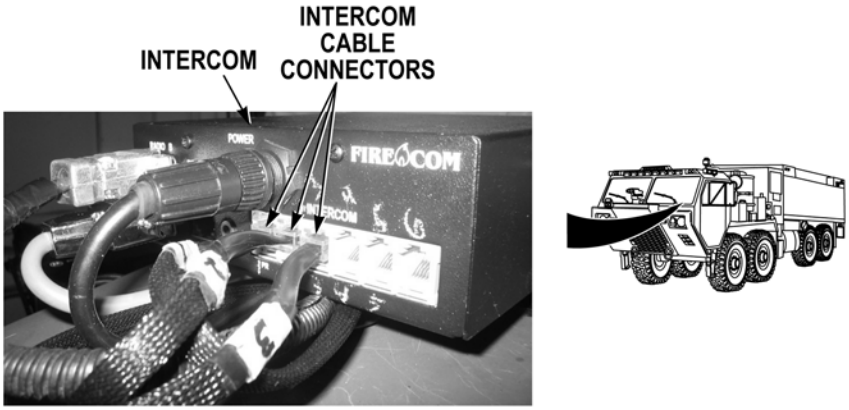
If vehicle commander's headset microphone can be heard through both headset earphones, go to Step 9.

Step 5. Disconnect vehicle commander's headset from passenger side intercom jack (WP 0004). Connect vehicle commander's headset into driver side intercom jack (WP 0004). While talking into vehicle commander's headset microphone, (do not press push-to-talk button), check if vehicle commander's headset microphone can be heard through both headset earphones.

a. If vehicle commander's headset microphone can be heard through both headset earphones, go to Step 10.

b. If vehicle commander's headset microphone cannot be heard through both headset earphones, replace vehicle commander's headset.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



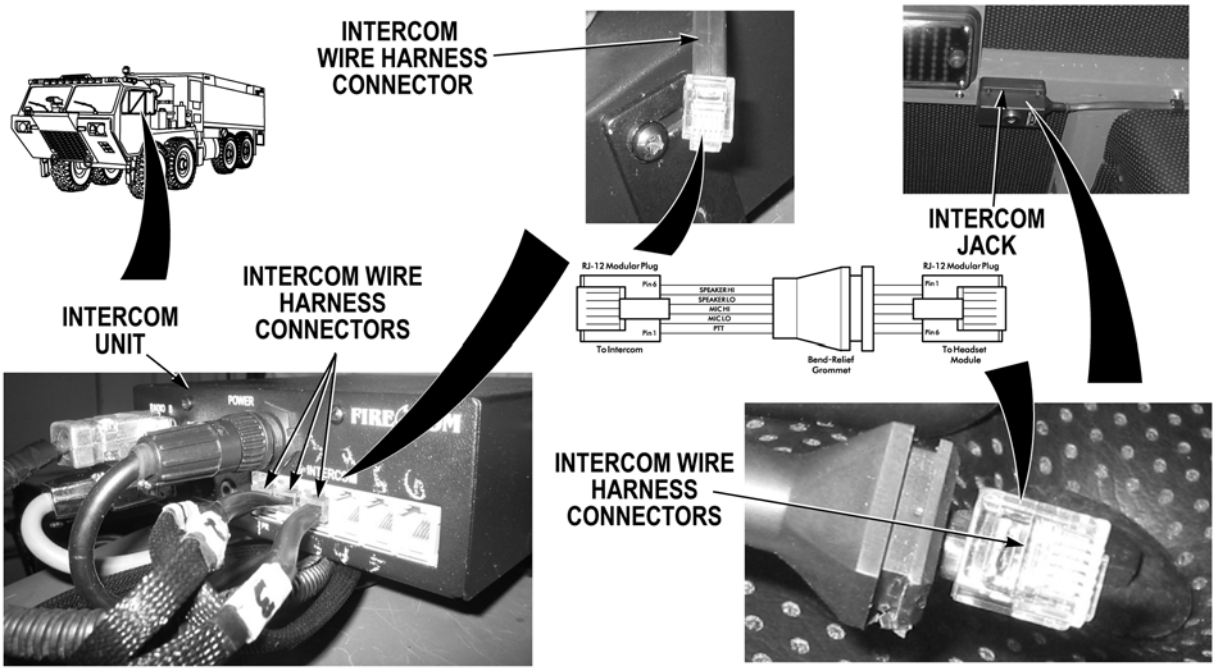
NOTE

If intercom wire harness connectors are not identified at intercom, disconnect wire harness connector one at a time until correct wire harness is identified. Reconnect connector before disconnecting next intercom wire harness connector.

Step 6. Disconnect driver's headset from pump operator's panel intercom jack (WP 0004). Connect driver's headset into driver side intercom jack (WP 0004). Disconnect driver side intercom cable connector from intercom (WP 0256). Disconnect passenger side intercom cable connector from intercom (WP 0256). Connect driver side intercom cable connector into passenger side intercom cable connector at intercom. While talking into driver's headset microphone, (do not press push-to-talk button), check if headset microphone can be heard through headset earphone.

If driver's headset microphone can be heard though headset earphones, replace intercom (WP 0255).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Note position of intercom jack prior to disconnect intercom cable to ensure proper installation.

Step 7. Pull battery disconnect switch to off position (WP 0007). Disconnect driver side intercom cable connector from intercom and reconnect passenger side intercom cable connector in original position (WP 0256). Disconnect intercom cable connector from driver side intercom jack (WP 0256). Check driver side intercom cable and connectors for bent terminals and damage.

If intercom cable has bent terminals or is damaged, replace intercom cable and connector (WP 0256).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

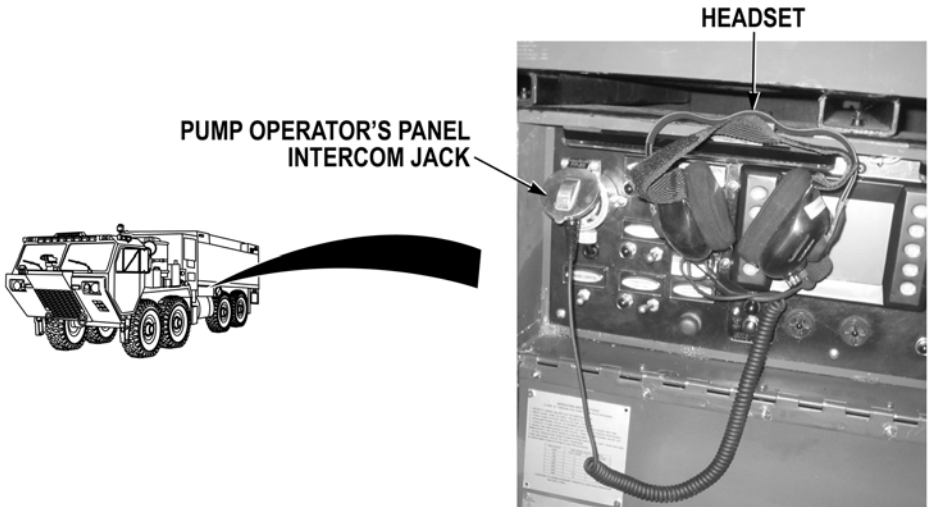
NOTE

Intercom wire harness RJ-12 connectors are mirrored from intercom connector to intercom jack connector in Step 8.

Step 8. With a test lead set, check continuity across driver side intercom cable, communication wire (blue) from intercom connector, terminal 1 to intercom jack connector, terminal 6, communication wire (yellow) from intercom connector, terminal 2 to intercom jack connector terminal 5, communication wire (green) from intercom connector, terminal 3 to intercom jack connector terminal 4, communication wire (red) from intercom connector, terminal 4 to intercom jack connector terminal 3, communication wire (black) from intercom connector, terminal 5 to intercom jack connector terminal 2, and communication wire (white) from intercom connector, terminal 6 to intercom jack connector terminal 1.

a. If there is continuity across wires, replace driver side intercom jack (WP 0256).

b. If there is no continuity across any individual wire, replace intercom cable and connectors (WP 0256).



Step 9. Disconnect vehicle commander's headset from passenger side intercom jack (WP 0004). Open pump operator's panel cover (WP 0010). Connect vehicle commander's headset into pump operator's panel intercom jack (WP 0004). While talking into vehicle commander's headset microphone, (do not press push-to-talk button), check if headset microphone can be heard through both headset earphones.

a. If vehicle commander's headset microphone can be heard through both headset earphones, go to Step 13.

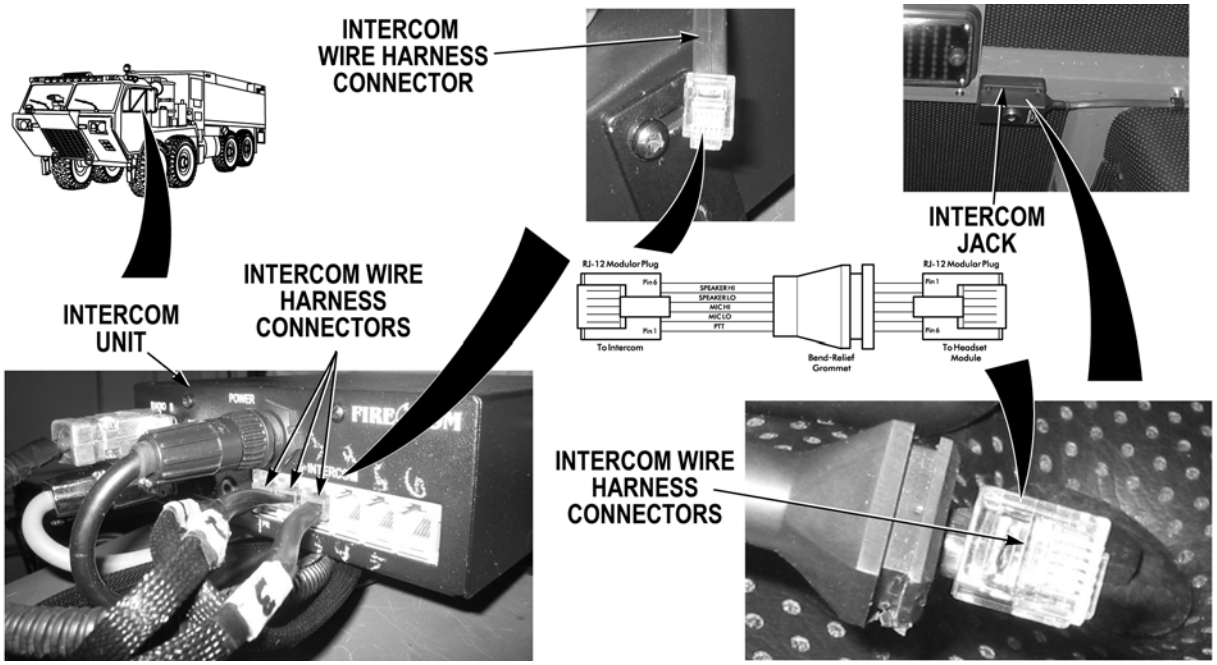
b. If vehicle commander's headset microphone cannot be heard through both headset earphones, replace intercom cable and connectors (WP 0256).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 10. Disconnect vehicle commander's headset from driver side intercom jack (WP 0004). Connect vehicle commander's headset into passenger side intercom jack (WP 0004). Disconnect passenger side intercom cable connector from intercom (WP 0256). Disconnect driver side intercom cable connector from intercom (WP 0256). Connect passenger side intercom cable connector into driver side intercom cable connector at intercom. While talking into vehicle commander's headset microphone, (do not press push-to-talk button), check if headset microphone can be heard through headset earphones.

If vehicle commander's headset microphone can be heard though headset earphones, replace intercom (WP 0255).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Note position of intercom jack prior to disconnecting intercom cable to ensure proper installation.

Step 11. Pull battery disconnect switch to off position (WP 0007). Disconnect passenger side intercom cable connector from intercom and reconnect driver side intercom cable connector in original position (WP 0256). Remove passenger side intercom jack cover and disconnect intercom cable connector (WP 0256). Check passenger side intercom cable and connectors for bent terminals and damage.

If intercom cable has bent terminals or is damaged, replace intercom cable and connector (WP 0256).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

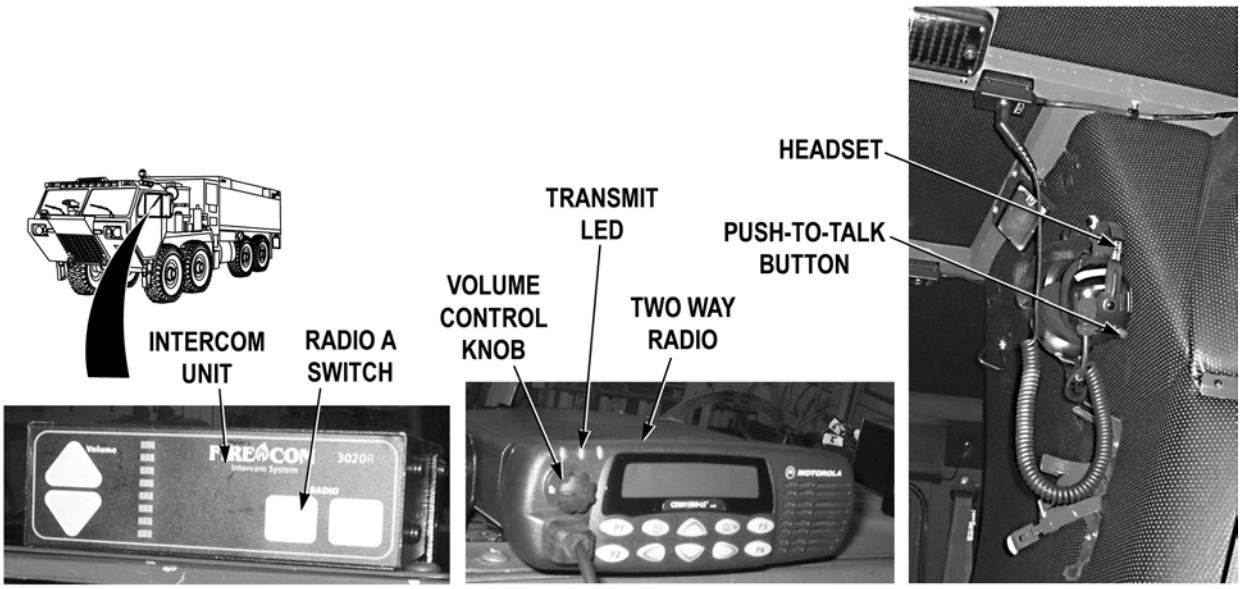
NOTE

Intercom wire harness RJ-12 connectors are mirrored from intercom connector to intercom jack connector in Step 12.

Step 12. With a test lead set, check continuity across passenger side intercom wire harness, communication wire (blue) from intercom connector, terminal 1 to intercom jack connector, terminal 6, communication wire (yellow) from intercom connector, terminal 2 to intercom jack connector terminal 5, communication wire (green) from intercom connector, terminal 3 to intercom jack connector terminal 4, communication wire (red) from intercom connector, terminal 4 to intercom jack connector terminal 3, communication wire (black) from intercom connector, terminal 5 to intercom jack connector terminal 2, and communication wire (white) from intercom connector, terminal 6 to intercom jack connector terminal 1.

a. If there is continuity across wires, replace passenger side intercom jack (WP 0256).

b. If there is no continuity across any individual wire, replace intercom cable and connectors (WP 0256).



Step 13. Disconnect vehicle commander's headset from pump operator's panel intercom jack (WP 0004). Connect vehicle commander's headset into passenger side intercom jack (WP 0004). Press intercom RADIO A button to select two-way radio (WP 0004). Push two-way radio volume control knob to on position (WP 0004). Adjust two-way radio volume as required for normal operations. While an assistant operates two-way radio, check if two-way radio communications can be heard through headset earphones.

If two-way radio communications cannot be heard through headset earphones, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NOTE

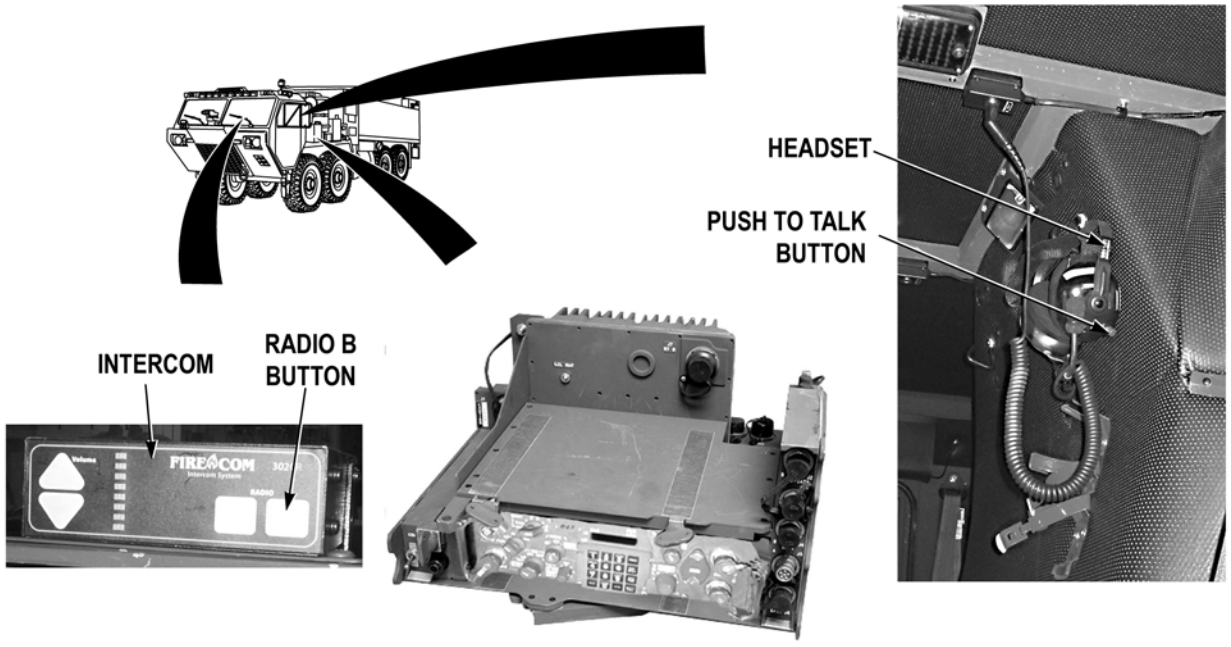
- Two-way radio transmit LED will illuminate when two-way radio keys up to transmit.
- Key up times will vary from time headset push-to-talk button is pressed until two-way radio is ready to transmit depending on intercom HK-A setting.

Step 14. While an assistant monitors two-way radio, press headset push-to-talk button and talk into microphone (WP 0004). Check if intercom keys up to transmit two-way radio.

If intercom does not key up two-way radio, go to Step 34.

Step 15. While an assistant monitors two-way radio, press headset push-to-talk button and talk into microphone (WP 0004). Check if headset communication can be heard at two-way radio.

If headset communications cannot be heard at two-way radio, go to Step 30.



Step 16. Press intercom RADIO B switch to select SINCGARS radio (WP 0004). Turn SINCGARS radio on (TM 9-2320-279-10). While an assistant operates SINCGARS radio, check if SINCGARS radio communications can be heard through vehicle commander's headset earphones.

If SINGCARS radio communications can not be heard through headset earphones, go to Step 22.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NOTE

Key up times will vary from time headset push-to-talk button is pressed until SINCGARS radio is ready to transmit depending on intercom HK-B setting.

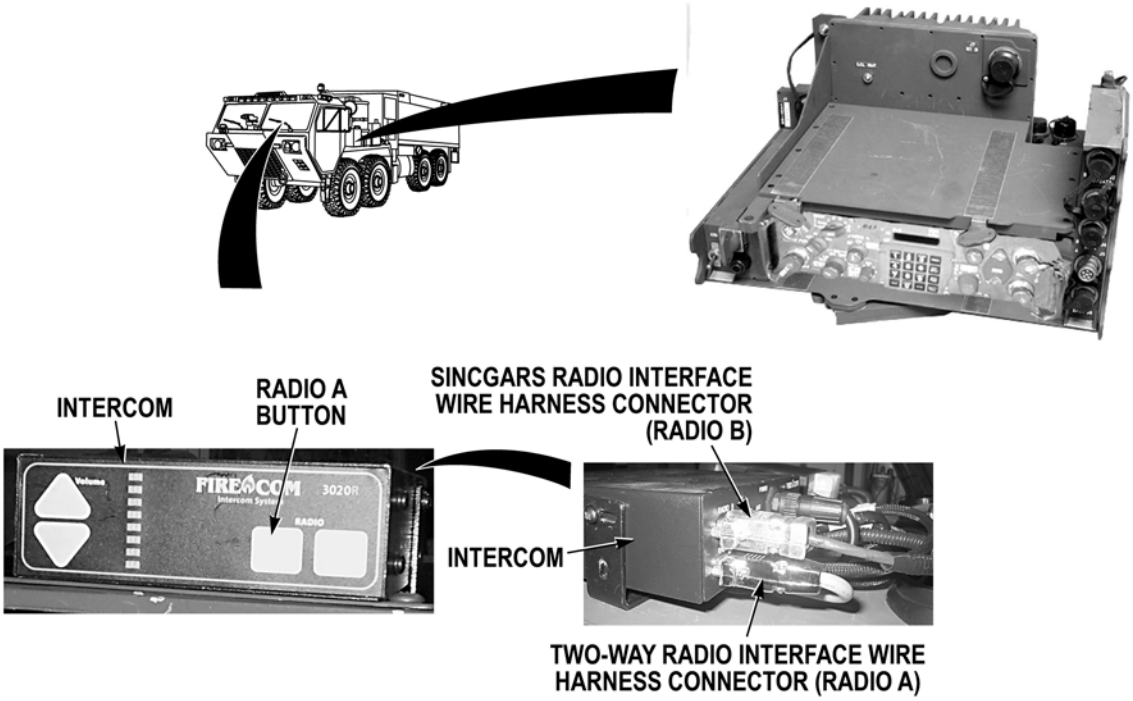
Step 17. While an assistant monitors SINCGARS radio, press headset push-to-talk button (WP 0004). Check if intercom keys up SINCGARS radio.

If intercom does not key up SINCGARS radio, go to Step 20.

Step 18. While an assistant monitors SINCGARS radio, press headset push-to-talk button and talk into microphone (WP 0004). Check if headset communication can be heard at SINCGARS radio.

If headset communications can be heard at SINCGARS radio, system is operating properly, notify supervisor.

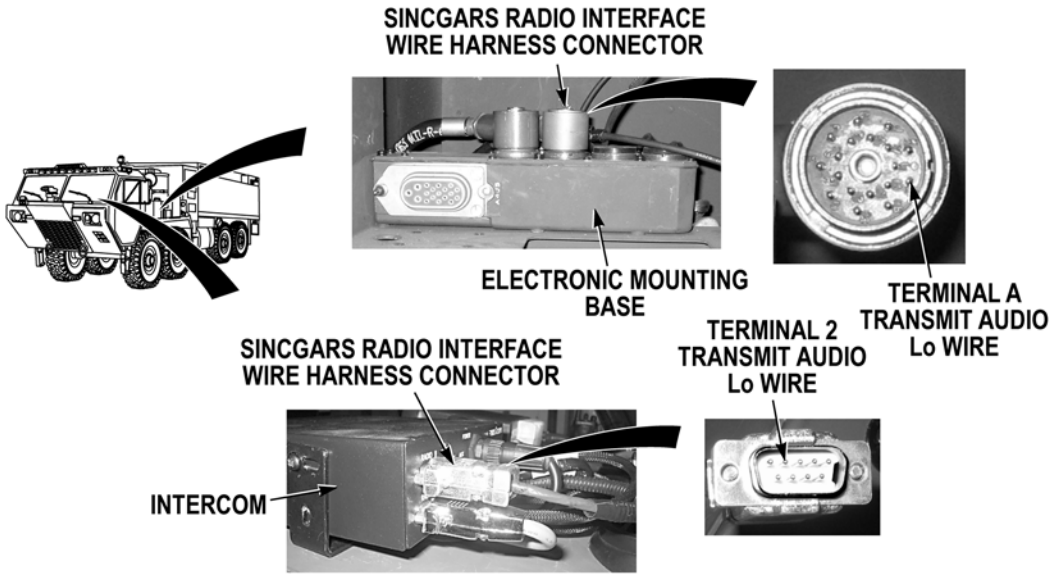
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 19. Pull battery disconnect switch to off position (WP 0007). Remove four screws and lift intercom away from intercom bracket (WP 0255). Disconnect SINCGARS interface wire harness connector from intercom RADIO B connector (WP 0290). Disconnect two-way radio interface wire harness connector from intercom RADIO A connector (WP 0290). Connect SINCGARS radio interface wire harness connector on intercom RADIO A connector. Push battery disconnect switch to on position (WP 0007). Press intercom RADIO A button (WP 0004). While an assistant operates SINCGARS radio, check if SINGARS radio communications can be heard through headset earphones.

If SINCGARS radio communications can be heard through headset earphones, replace intercom (WP 0255).

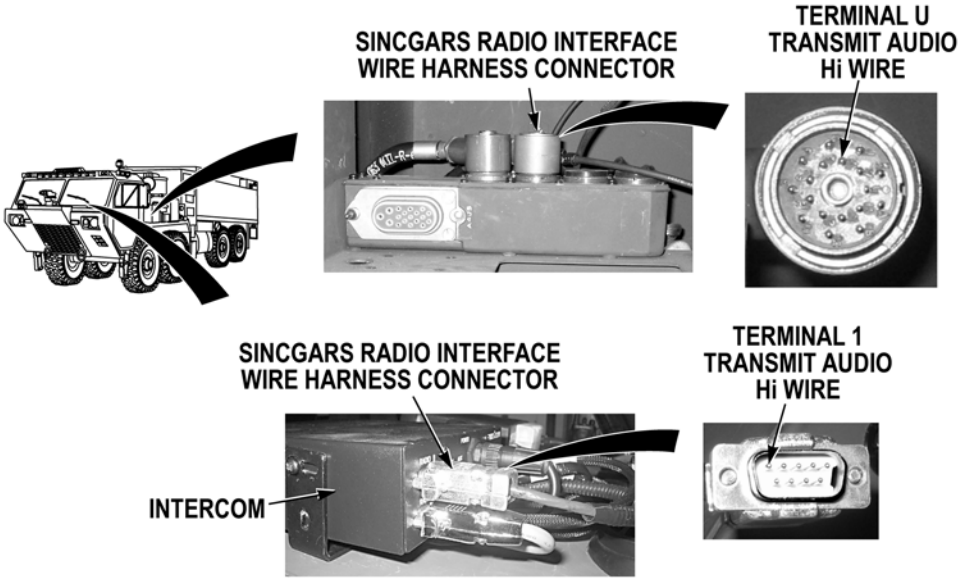
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 20. Remove and install SINCGARS radio and two-way radio interface wire harnesses in original positions. Pull battery disconnect switch to off position (WP 0007). Remove SINCGARS receiver transmitter and power adapter from electronic mounting base (TM 11-5820-890-10). Disconnect SINCGARS radio interface wire harness connectors from electronics mounting base and intercom (WP 0290). With a lead test set, check for continuity across SINCGARS radio interface wire harness transmit audio Lo wire (red) from intercom connector, terminal 2 to SINCGARS radio connector, terminal A.

If there is no continuity, repair transmit audio Lo wire if repairable (TM 9-2320-315-14&P), or replace SINCGARS radio interface wire harness (WP 0290).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

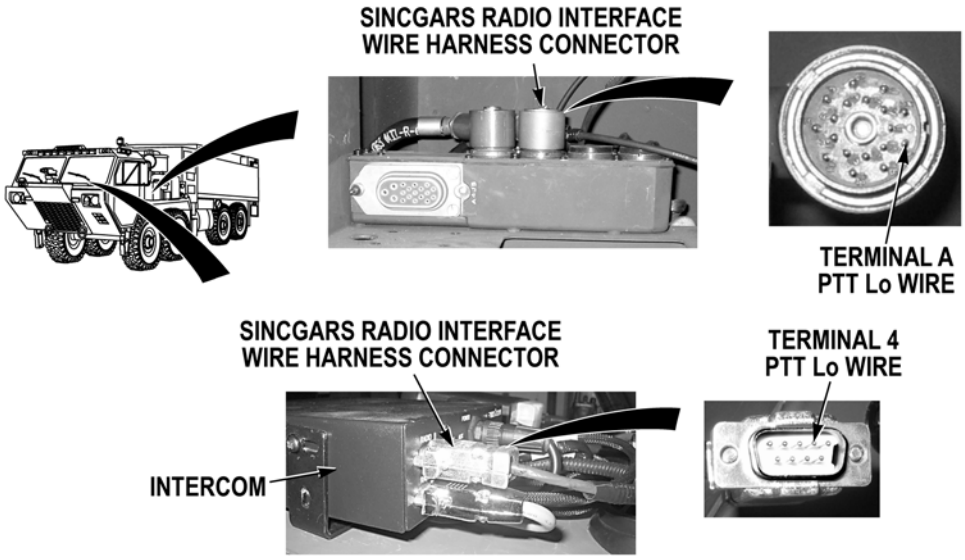


Step 21. With a lead test set, check for continuity across SINCGARS radio interface wire harness transmit audio Hi wire (brown) from intercom connector, terminal 1 to SINCGARS radio connector, terminal U.

a. If there is continuity, fault is in SINCGARS electronic mounting base, power adapter, or receiver transmitter, notify supervisor.

b. If there is no continuity, repair transmit audio Hi wire if repairable (TM 9-2320-315-14&P), or replace SINCGARS radio interface wire harness (WP 0290).

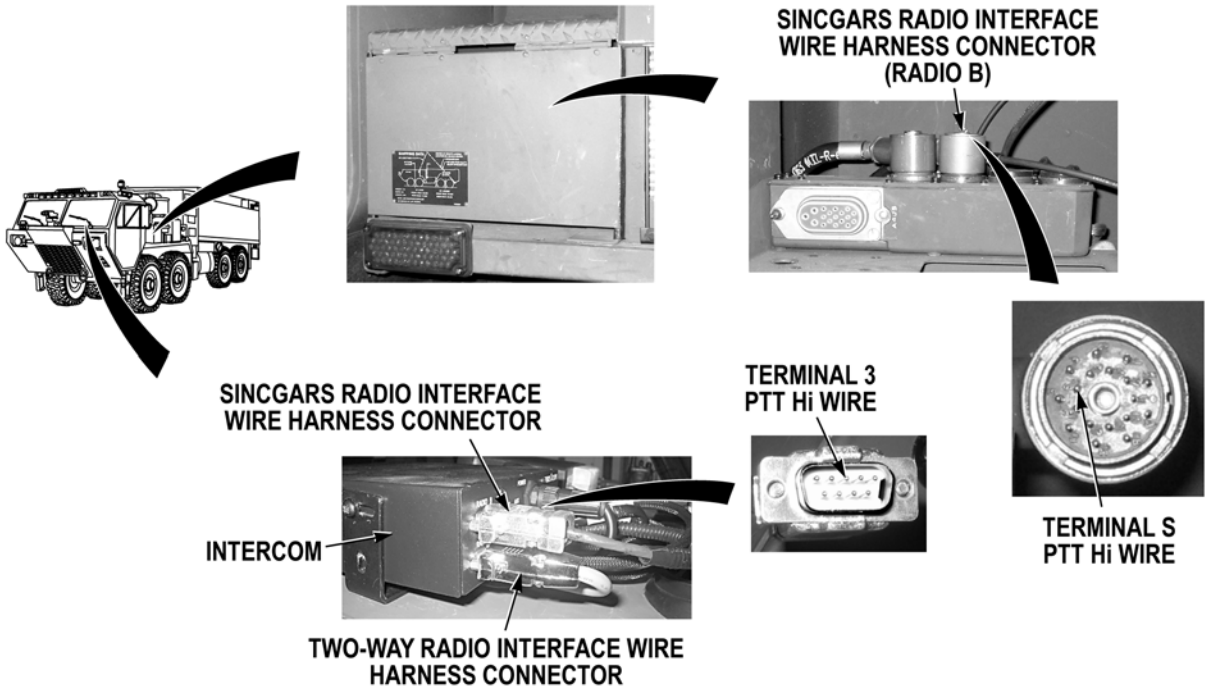
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 22. Pull battery disconnect switch to off position (WP 0007). Remove SINCGARS receiver transmitter and power adapter from electronic mounting base (TM 11-5820-890-10). Disconnect SINCGARS radio interface wire harness connectors from electronics mounting base and intercom (WP 0290). With a lead test set, check for continuity across SINCGARS radio interface wire harness PTT Lo wire (yellow) from intercom connector, terminal 4 to SINCGARS radio connector, terminal A.

If there is no continuity, repair PTT Lo wire if repairable (TM 9-2320-315-14&P), or replace SINCGARS radio interface wire harness (WP 0290).

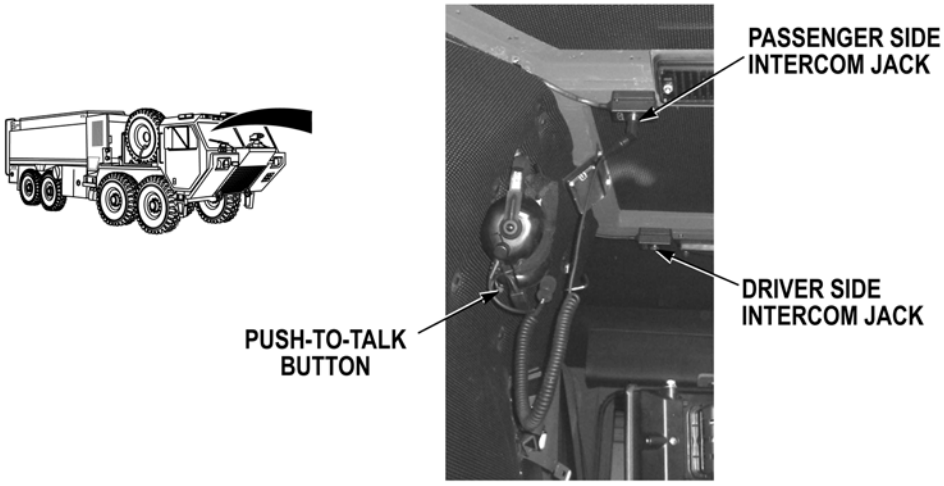
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 23. With a lead test set, check for continuity across SINCGARS radio interface wire harness PTT Hi wire (orange) from intercom connector, terminal 3 to SINCGARS radio connector, terminal S.

If there is no continuity, repair PTT Hi wire if repairable (TM 9-2320-315-14&P), or replace SINCGARS radio interface wire harness (WP 0290).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

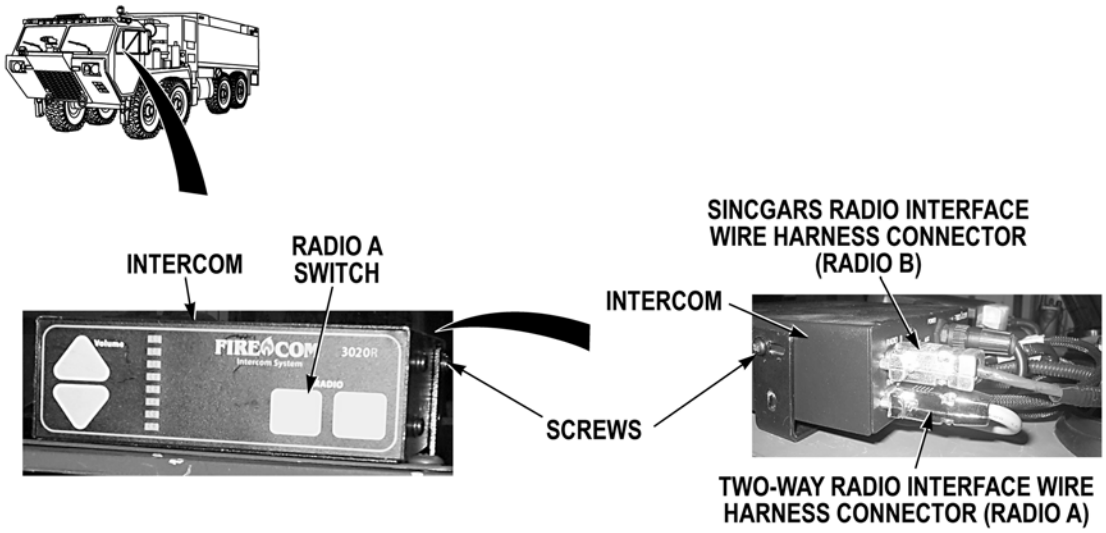


Step 24. Connect SINCGARS radio interface wire harness connectors on electronic mounting base and intercom (WP 0290). Install power adaptor and SINCGARS receiver transmitter on electronic mounting base (TM 11-5820-890-10). Disconnect vehicle commander's headset from passenger side intercom jack (WP 0004). Connect vehicle commander's headset into driver side intercom jack (WP 0004). Push battery disconnect switch to on position (WP 0007).While an assistant monitors SINCGARS radio, press headset push-to-talk button (WP 0004). Check if intercom keys up to transmit SINCGARS radio.

a. If intercom keys up SINCGARS radio, replace intercom cables and connectors (WP 0256).

b. If intercom does not key up SINCGARS radio, fault is in SINCGARS electronic mounting base, power adapter, or receiver transmitter, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



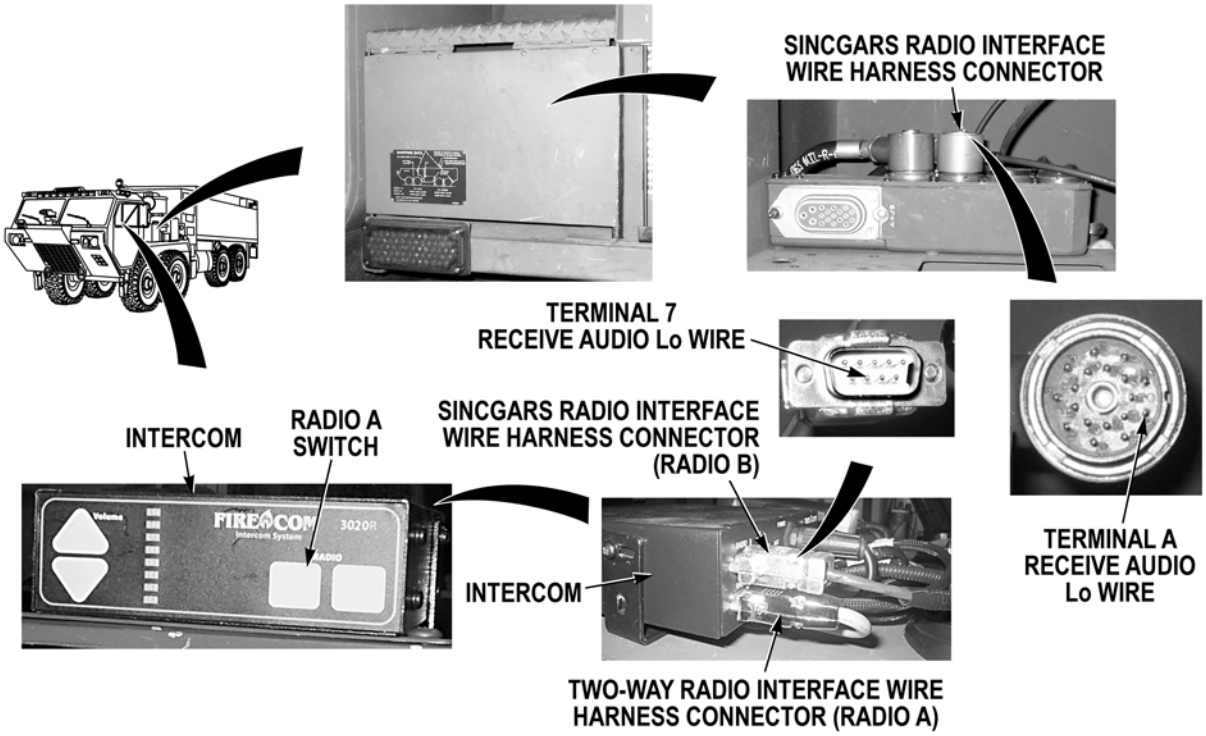
Step 25. Inspect SINCGARS radio interface wire harness connectors at intercom and SINCGARS electronic mounting base for loose connectors.

If SINCGARS interface wire harness connectors are loose tighten connection (WP 0290),

Step 26. Remove four screws and lift intercom away from intercom bracket (WP 0255). Disconnect SINCGARS interface wire harness connector from intercom RADIO B connector (WP 0290). Disconnect two-way radio interface wire harness connector from intercom RADIO A connector (WP 0290). Connect SINCGARS radio interface wire harness connector on intercom RADIO A connector. Press intercom RADIO A button (WP 0004). While an assistant operates SINCGARS radio, check if SINGARS radio communications can be heard through headset earphones.

If SINCGARS radio communications can be heard through headset earphones, replace intercom (WP 0255).

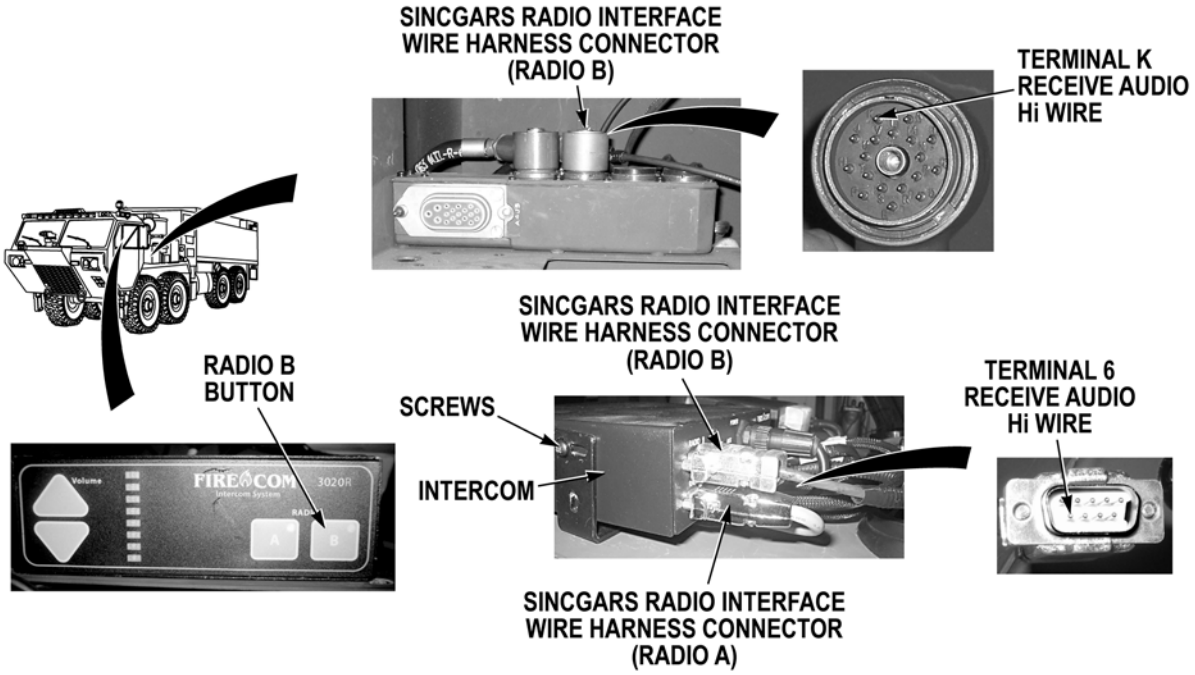
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 27. Remove and install SINCGARS radio and two-way radio interface wire harnesses on original positions. Pull battery disconnect switch to off position (WP 0007). Remove SINCGARS receiver transmitter and power adapter from electronic mounting base (TM 11-5820-890-10). Disconnect SINCGARS radio interface wire harness connectors from electronics mounting base and intercom (WP 0290). With a lead test set, check for continuity across SINCGARS radio interface wire harness receive audio Lo wire (violet) from intercom connector, terminal 7 to SINCGARS radio connector, terminal A.

If there is no continuity, repair receive audio Lo wire if repairable (TM 9-2320-315-14&P), or replace SINCGARS radio interface wire harness (WP 0290).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 28. Check for continuity across SINCGARS radio interface wire harness receive audio Hi wire (blue) from intercom connector, terminal 6 to SINCGARS radio connector, terminal K.

a. If there is continuity, fault is in SINCGARS electronic mounting base, power adapter, or receiver transmitter, notify Supervisor.

b. If there is no continuity, repair receive audio Hi wire if repairable (TM 9-2320-315-14&P), or replace SINCGARS radio interface wire harness (WP 0290).

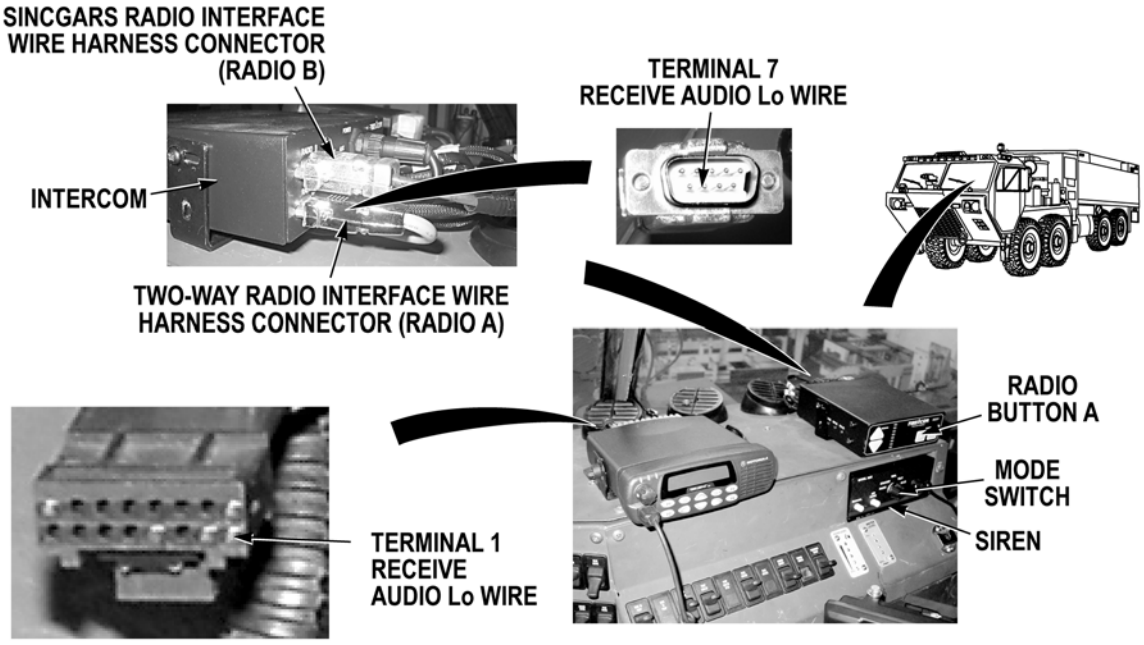
Step 29. Inspect two-way radio interface wire harness connectors at intercom and two-way radio for loose connectors.

If two-way radio interface wire harness connectors are loose tighten connection (WP 0290),

Step 30. Remove four screws and lift intercom away from intercom bracket (WP 0255). Disconnect SINCGARS interface wire harness connector from intercom RADIO B connector (WP 0290). Disconnect two-way radio interface wire harness connector from intercom RADIO A connector (WP 0290). Connect two-way radio interface wire harness connector on intercom RADIO B connector. Press intercom RADIO B button (WP 0004). While an assistant operates two-way radio, check if two-way radio communications can be heard through headset earphones.

If two-way radio communications can be heard through headset earphones, replace intercom (WP 0255).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



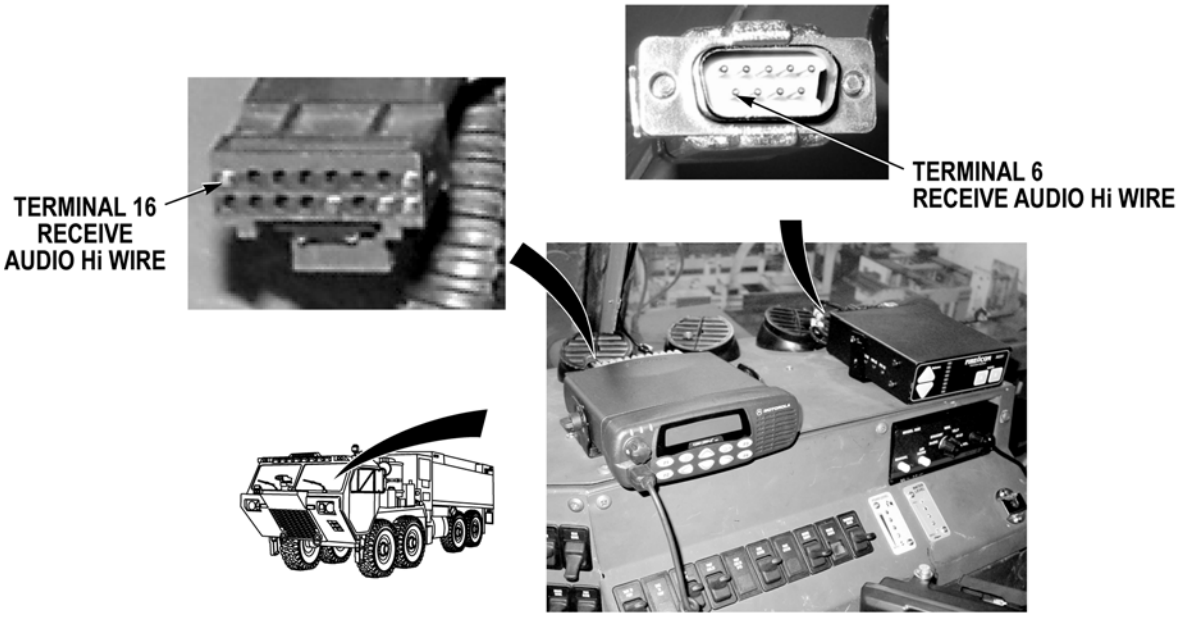
Step 31. Put EMERG MASTER switch to on position (WP 0004). Turn Service Drive Lights on (TM 9-2320-279-10). Remove and install two-way radio and SINCGARS interface wire harnesses in original positions. Press intercom RADIO A button (WP 0004). Put siren mode select switch to RADIO position (WP 0004). While an assistant operates two-way radio, check if two-way radio communications can be heard through siren speaker.

If two-way radio communications can be heard through siren speaker, repair two-way radio interface wire harness if repairable (TM 9-2320-315-14&P), or replace two-way radio interface wire harness (WP 0290).

Step 32. Pull battery disconnect switch to off position (WP 0007). Disconnect two-way radio interface wire harness connectors from two-way radio and intercom (WP 0290). With a test lead set, check for continuity across two-way radio interface wire harness receive audio Lo wire (violet) from intercom connector, terminal 7 to two-way radio connector, terminal 1.

If there is no continuity, repair receive audio Lo wire if repairable (TM 9-2320-315-14&P), or replace two-way radio interface wire harness (WP 0290).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

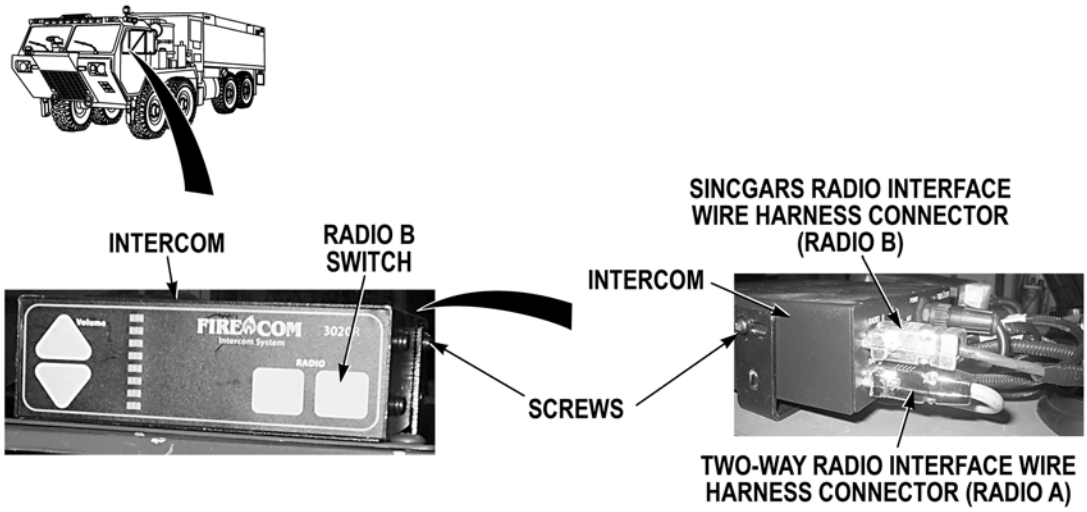


Step 33. With a test lead set, check for continuity across two-way radio interface wire harness receive audio Hi wire (blue) from intercom connector, terminal 6 to two-way radio connector, terminal 16.

a. If there is continuity, replace two-way radio (WP 0275).

b. If there is no continuity, repair receive audio Hi wire if repairable (TM 9-2320-315-14&P), or replace two-way radio interface wire harness (WP 0290).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



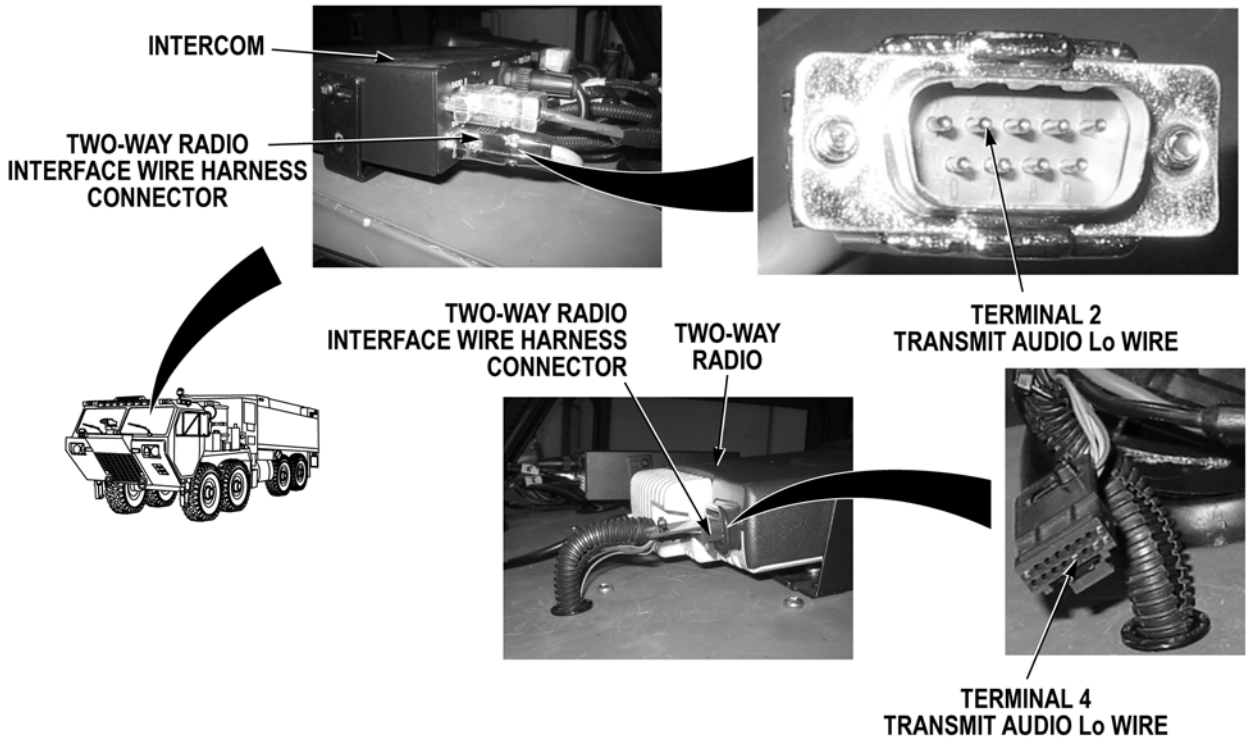
Step 34. Inspect two-way radio interface wire harness connectors at intercom and two-way radio for loose connectors.

If two-way radio interface wire harness connectors are loose, tighten connection (WP 0290),

Step 35. Remove four screws and lift intercom away from intercom bracket (WP 0255). Disconnect SINCGARS interface wire harness connector from intercom RADIO B connector (WP 0290). Disconnect two-way radio interface wire harness connector from intercom RADIO A connector (WP 0290). Connect two-way radio interface wire harness connector on intercom RADIO B connector. Press intercom RADIO B button (WP 0004). While an assistant monitors two-way radio, check if headset communications can be heard through two-way radio.

If headset communications can be heard through two-way radio, replace intercom (WP 0255).

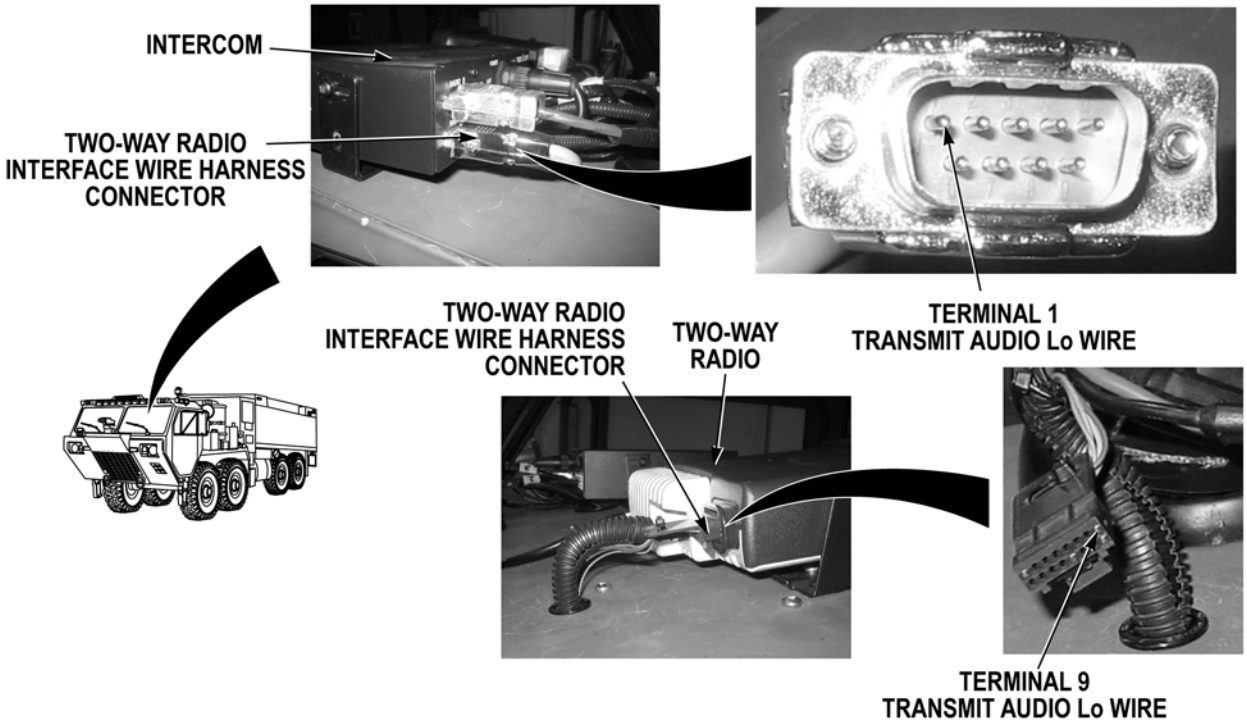
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 36. Remove and install two-way radio and SINCGARS interface wire harnesses in original positions. Pull battery disconnect switch to off position (WP 0007). Disconnect two-way radio interface wire harness connectors from two-way radio and intercom (WP 0290). With a test lead set, check for continuity across two-way radio interface wire harness transmit audio Lo wire (red) from intercom connector, terminal 2 to two-way radio connector, terminal 4.

If there is no continuity, repair transmit audio Lo wire if repairable (TM 9-2320-315-14&P), or replace two-way radio interface wire harness (WP 0290).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

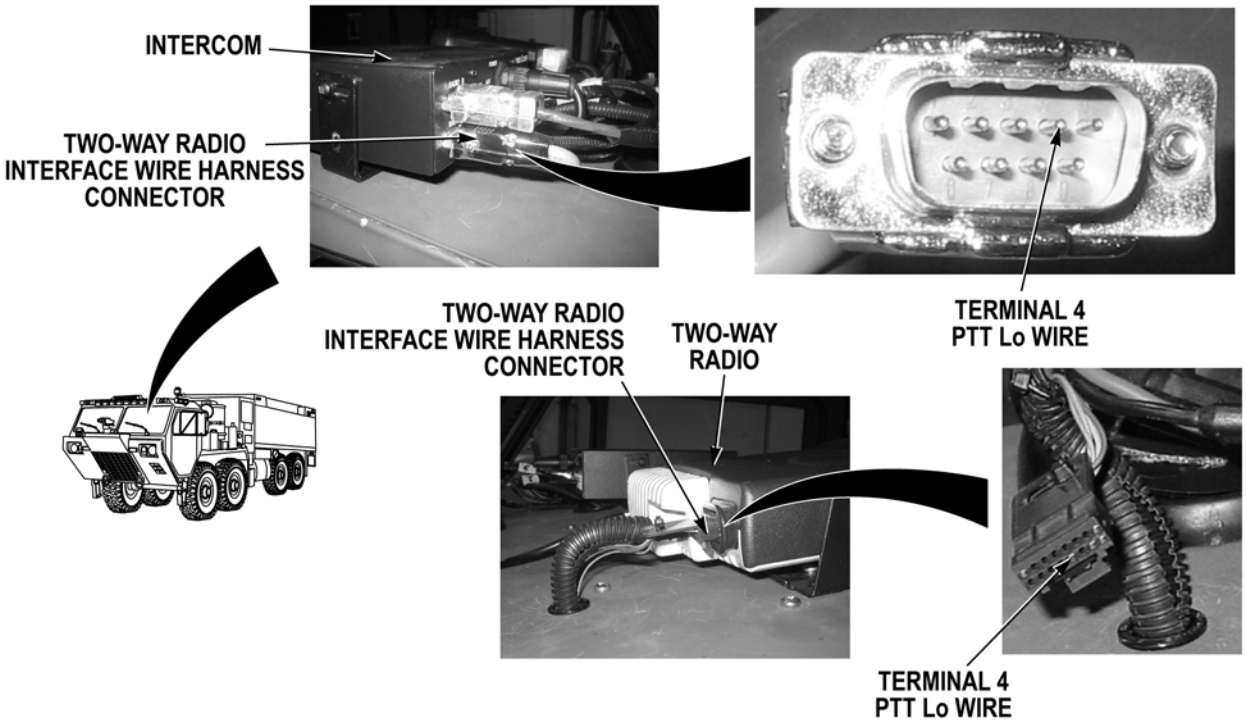


Step 37. With a test lead set, check for continuity across two-way radio interface wire harness transmit audio Hi wire (brown) from intercom connector, terminal 1 to two-way radio connector, terminal 9.

a. If there is continuity, replace two-way radio (WP 0275).

b. If there is no continuity, repair transmit audio Hi wire if repairable (TM 9-2320-315-14&P), or replace two-way radio interface wire harness (WP 0290).

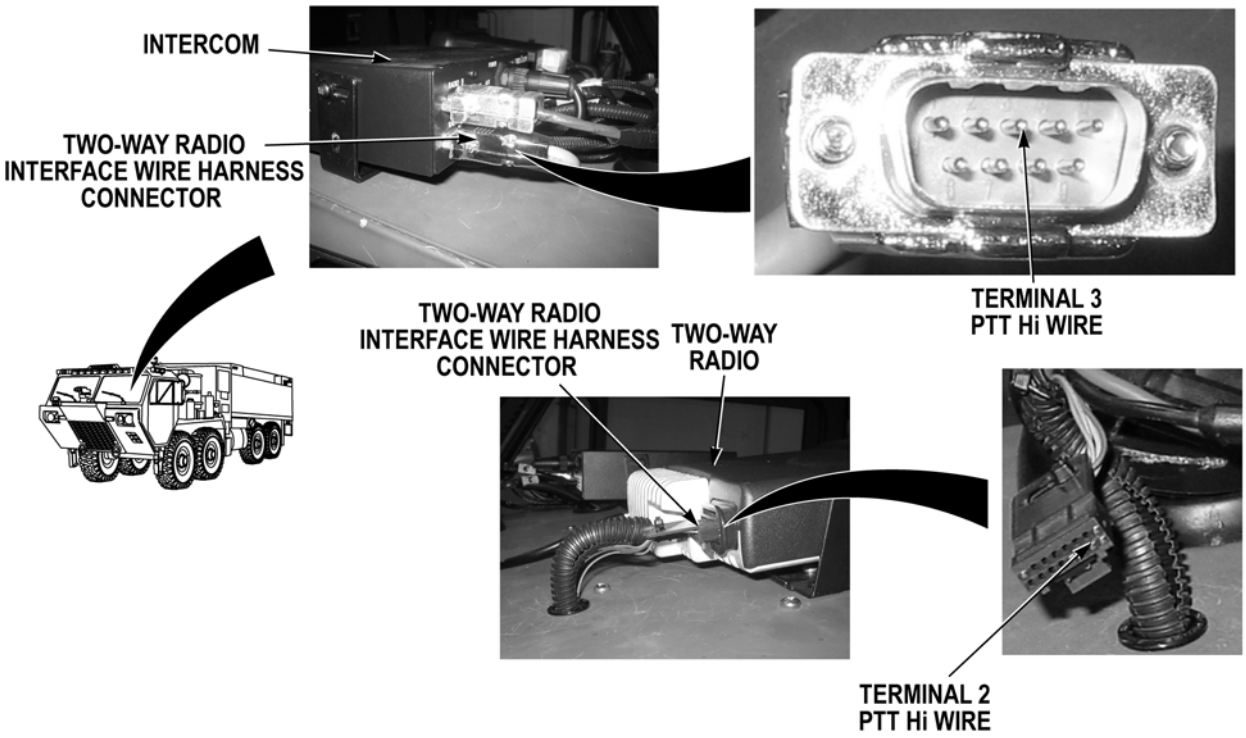
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 38. Disconnect two-way radio interface wire harness connectors from two-way radio and intercom (WP 0290). With a test lead set, check for continuity across two-way radio interface wire harness PTT Lo wire (yellow) from intercom connector, terminal 4 to two-way radio connector, terminal 4.

If there is no continuity, repair PTT Lo wire if repairable (TM 9-2320-315-14&P), or replace two-way radio interface wire harness (WP 0290).

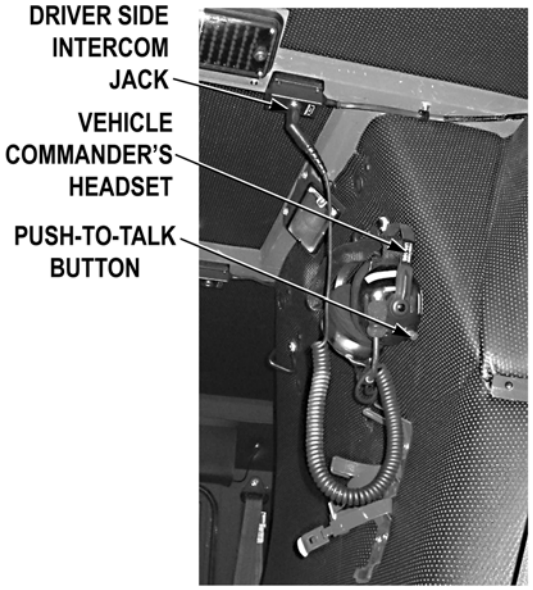
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 39. With a test lead set, check for continuity across two-way radio interface wire harness PTT Hi wire (orange) from intercom connector, terminal 3 to two-way radio connector, terminal 2.

If there is no continuity, repair PTT Hi wire if repairable (TM 9-2320-315-14&P), or replace two-way radio interface wire harness (WP 0290).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

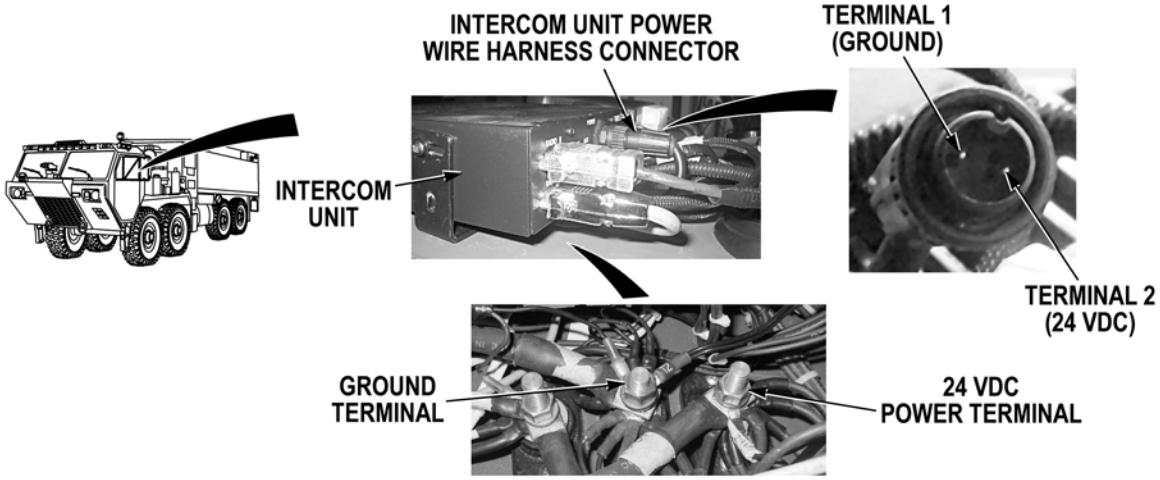


Step 40. Connect two-way radio interface wire harness connectors on two-way radio and intercom (WP 0290).Disconnect vehicle commander's headset from passenger side intercom jack (WP 0004). Connect vehicle commander's headset into driver side intercom jack (WP 0004). While an assistant monitors two-way radio, press headset push-to-talk button (WP 0004). Check if intercom keys up to transmit two-way radio.

a. If intercom keys up two-way radio, replace intercom cables and connectors (WP 0256).

b. If intercom does not key up two-way radio, replace two-way radio (WP 0275).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 41. Disconnect intercom power wire harness connector. With a test lead set, check for 22 to 28 VDC between intercom power wire harness connector terminals 1 and 2.

If 22 to 28 VDC are present, replace intercom (WP 0255).

Step 42. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Check intercom power wire harness wire connections at cab power distribution block 24 VDC power and ground terminals.

a. If connections are loose, tighten connections (WP 0290).

b. If connections are not loose, repair intercom power wire harness wires if repairable (TM 9-2320-315-14&P) or replace intercom (WP 0255).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PASSENGER SIDE STOWAGE COMPARTMENT STRIPLIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0008
WP 0100
WP 0203

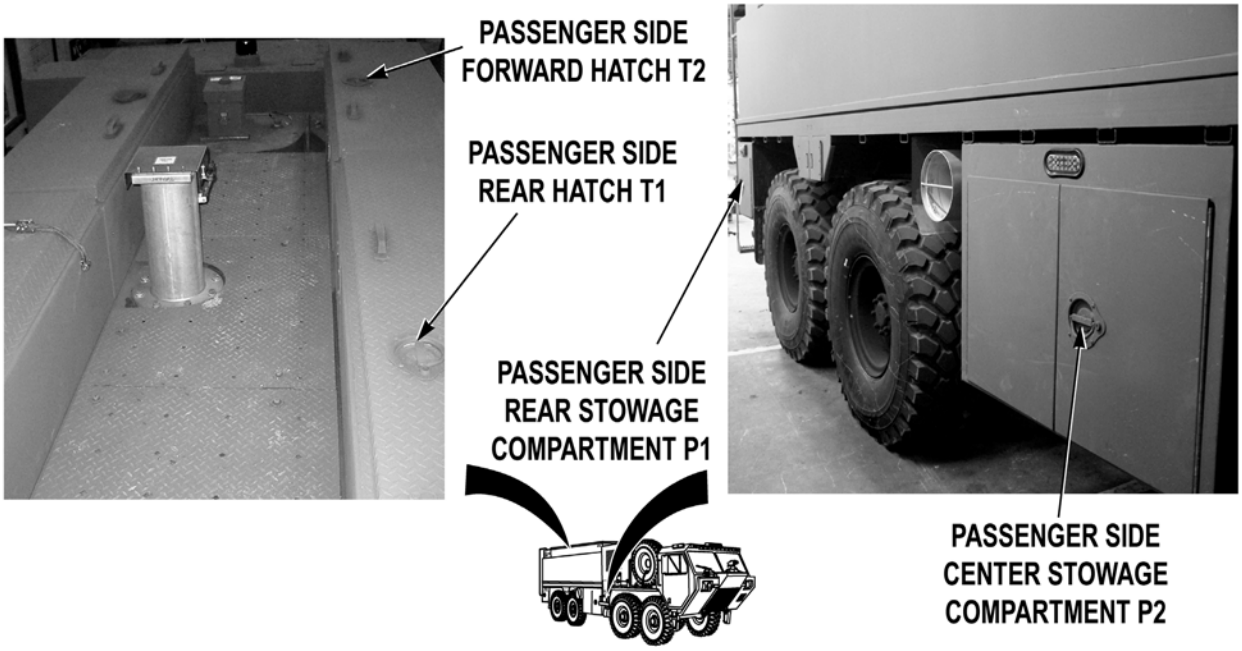
References (continued)
WP 0213
WP 0240
WP 0245
WP 0280
WP 0293
WP 0299

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PASSENGER SIDE STOWAGE COMPARTMENT STRIPLIGHT(S) DOES NOT OPERATE

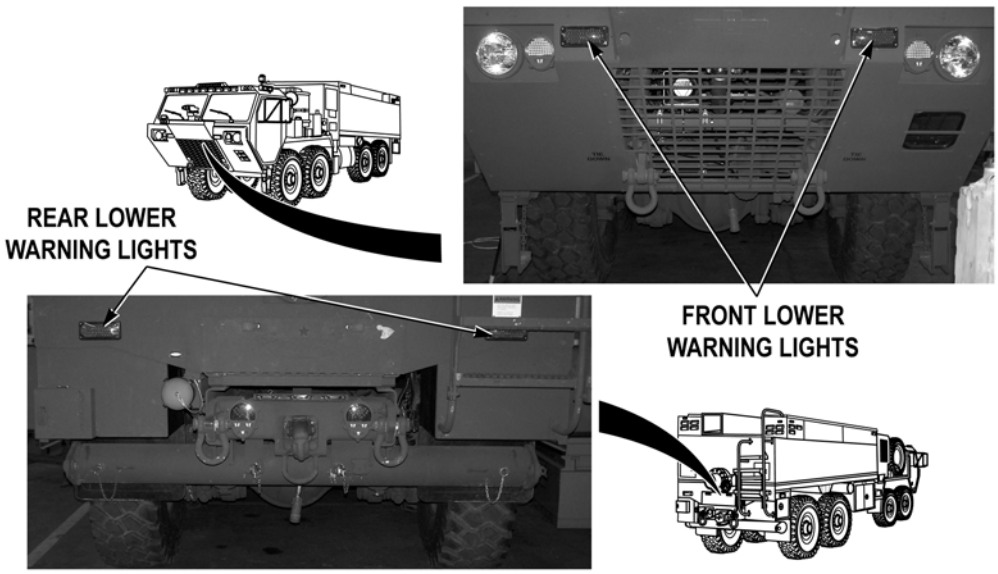
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Open all passenger side compartment doors and hatches (WP 0008). Check if at least one passenger side stowage compartment striplight operates.

If at least one passenger side stowage compartment striplight operates, go to Step 8.

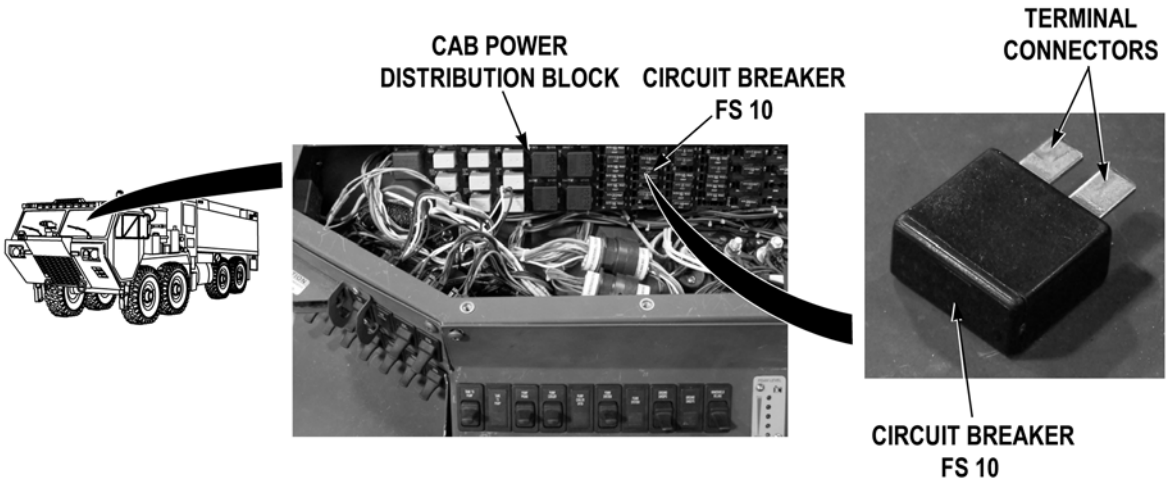
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 2. Put EMERG MASTER and F/R LOWER WARNING switches to on position (WP 0004). Check if front and rear lower warning lights operate.

If front and rear lower warning lights do not operate, troubleshoot Warning Lights (All) Do Not Operate (WP 0100).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



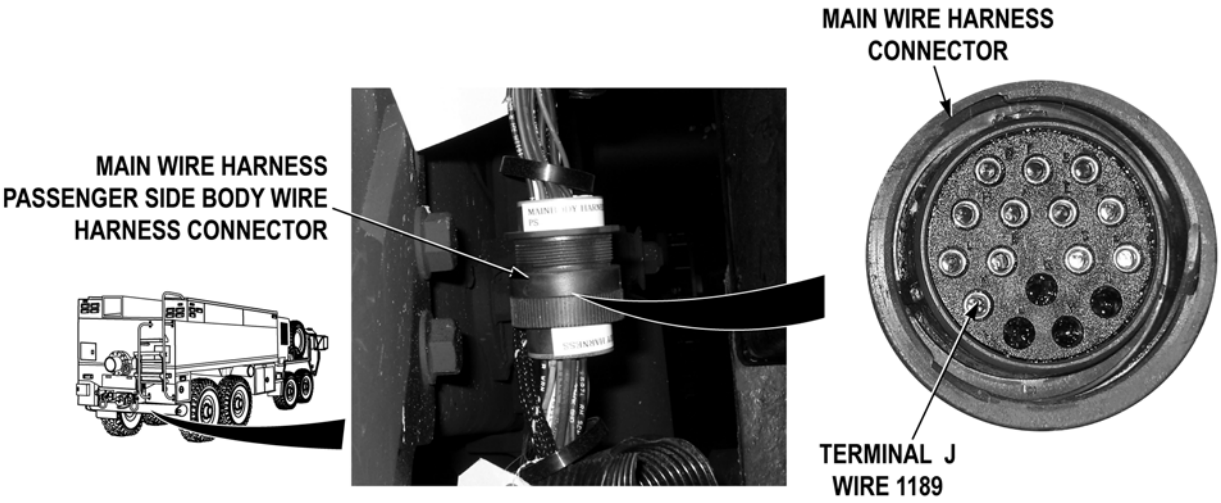
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. PUT EMERG MASTER and F/R LOWER WARNING switches to off position (WP 0004). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 10 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 10 (WP 0240).

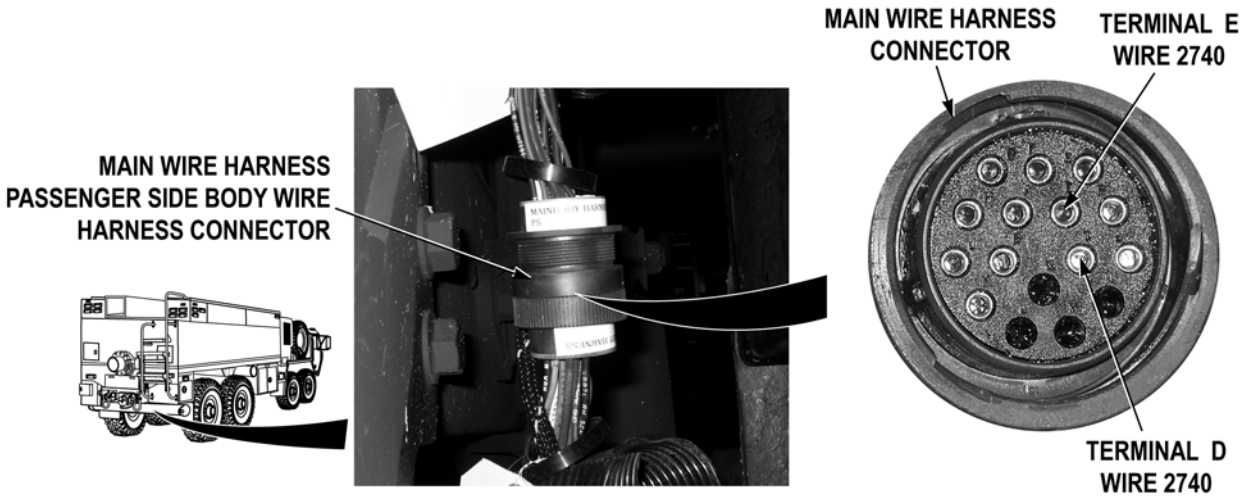
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Install circuit breaker FS 10 (WP 0240). Disconnect main wire harness passenger side body wire harness connector. Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). With a test lead set, check for 22 to 28 VDC between wire 1189 (red) at main wire harness passenger side body wire harness connector, terminal J and a known good ground.

If 22 to 28 VDC are not present, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



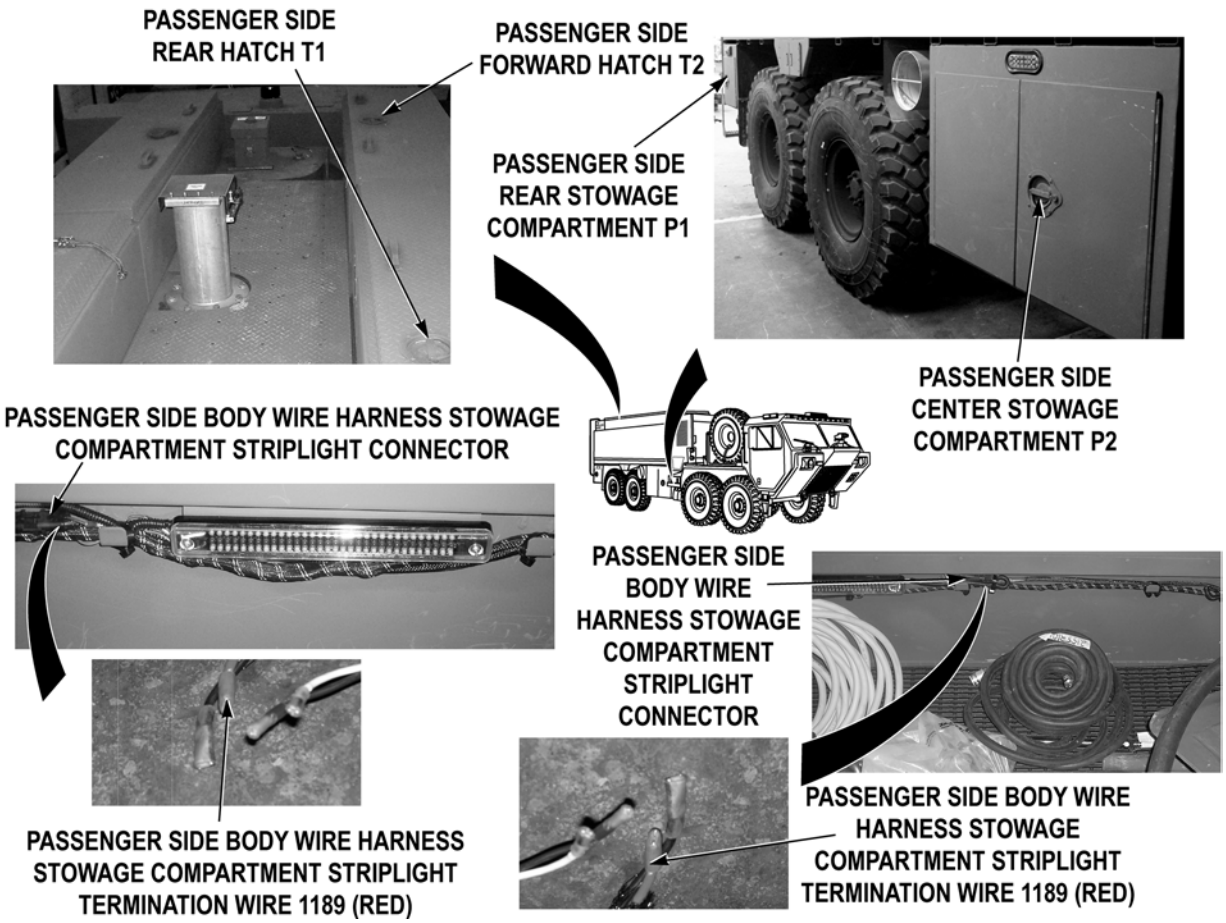
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across main wire harness wire 2740 (black) from passenger side body wire harness connector, terminals D and E to a known good ground.

If there is no continuity at terminal D or E, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

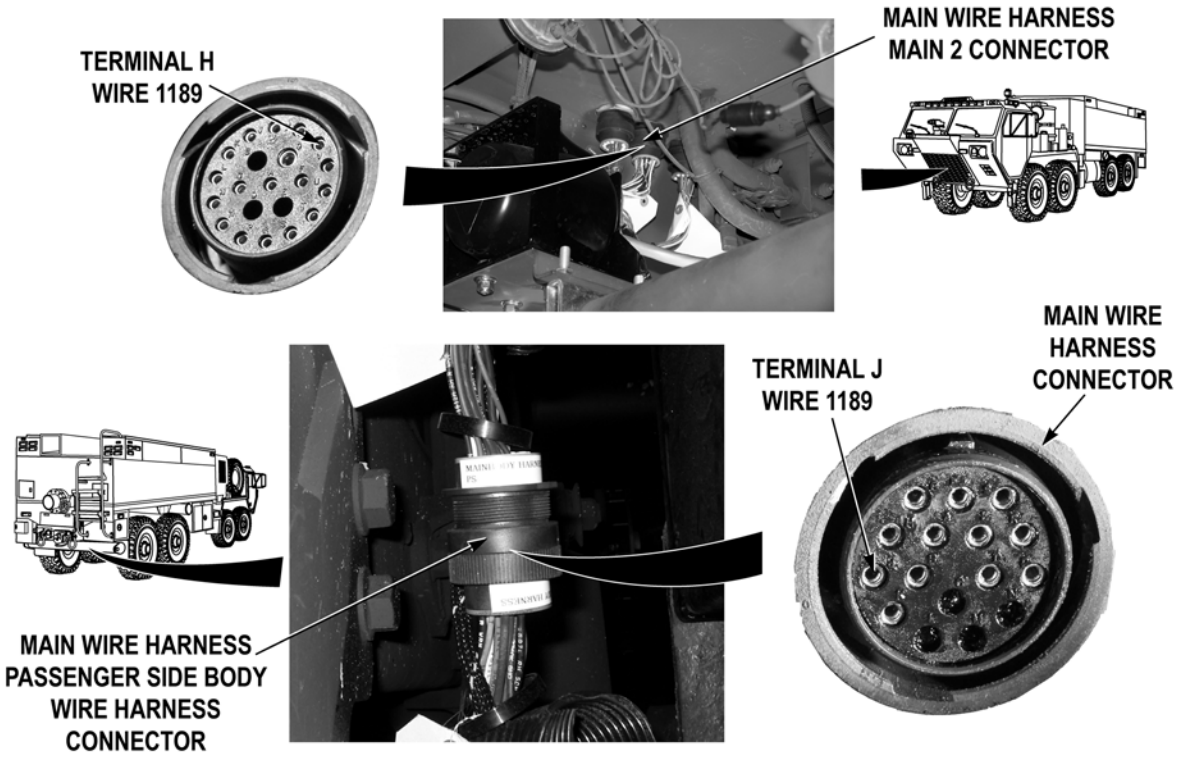


Step 6. Connect main wire harness passenger side body wire harness connector. Remove one of the passenger side stowage compartment striplights (WP 0213). Cut passenger side body wire harness stowage compartment striplight butt splice connector wire 1189 (red). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between wire 1189 (red) at passenger side body wire harness stowage compartment striplight connector termination and a known good ground.

a. If 22 to 28 VDC are present, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

b. If 22 to 28 VDC are not present, repair wire 1189 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 7. Remove skid plate grille (WP 0350). Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness main 2 connector. With a test lead set, check for continuity across wire 1189 (red) from main wire harness main 2 connector, terminal H to main wire harness passenger side body wire harness connector, terminal J.

a. If there is continuity, repair wire 1189 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

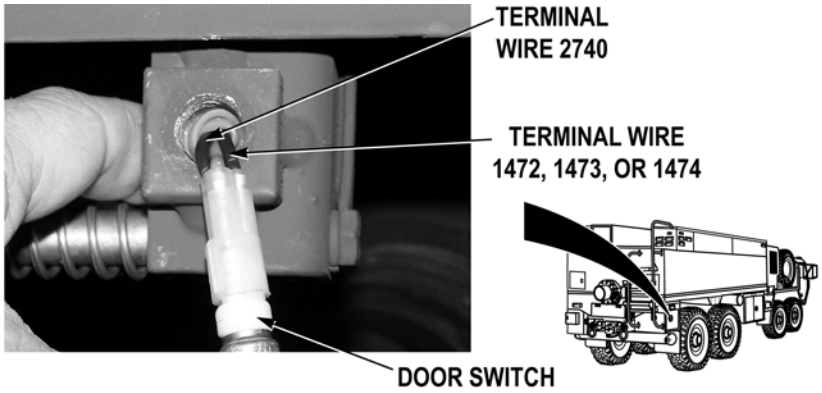
b. If there is no continuity, repair wire 1189 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 8. Check if non-operating stowage compartment striplight is located in passenger side center stowage compartment P2.

If non-operating stowage compartment striplight is located in center stowage passenger side compartment P2, go to Step 14.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

NOTE

- If more than one stowage compartment striplight is not operating, perform the following steps at non-operating stowage compartment striplights.
- Wires 1472, 1473, and 1474 are troubleshot the same way. Wire 1472 is at rear passenger side hatch. Wire 1473 is located at rear passenger side stowage compartment. And wire 1474 is located at front passenger side hatch.
- If wire 1472, 1473, or 1474 cannot be identified at door switch, measure continuity between both black wire terminals to ground. Continuity should be measured between all terminals, when switch is closed (door switch is not pressed).

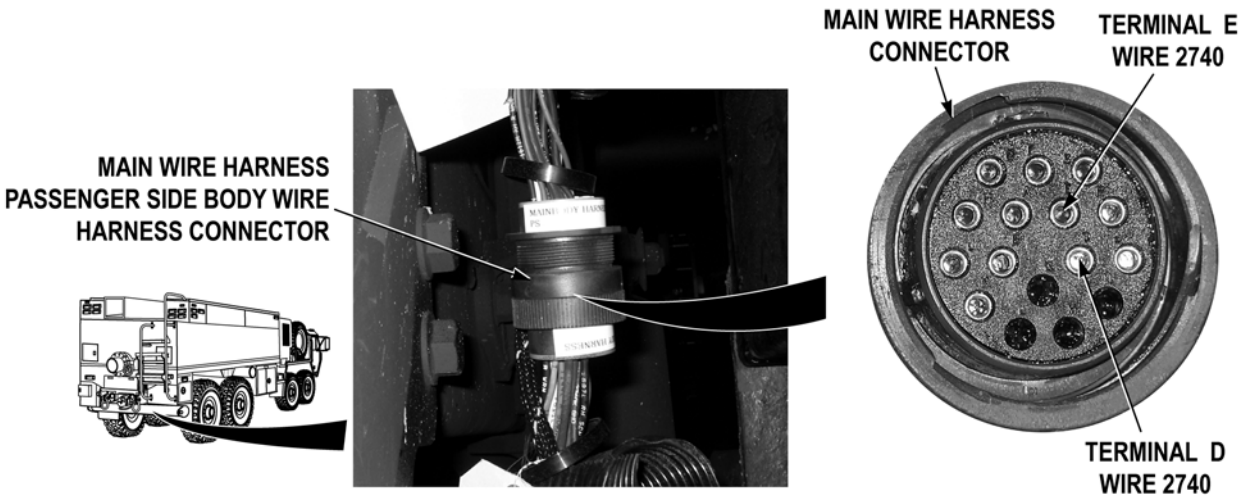
Step 9. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Close all rear doors and hatches except door/hatch that has non-operating stowage compartment striplight (WP 0008). Remove door switch associated with non-operating stowage compartment striplight (WP 0245). Do not disconnect wires. Check for continuity between door switch terminal wire 1472, 1473, or 1474 (black) and a known good ground when switch is closed (door switch is not pressed).

If there is continuity, go to Step 12.

Step 10. Check for continuity across door switch between terminal wire 1472, 1473, or 1474 (black) and terminal wire 2740 (black).

If there is no continuity, replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

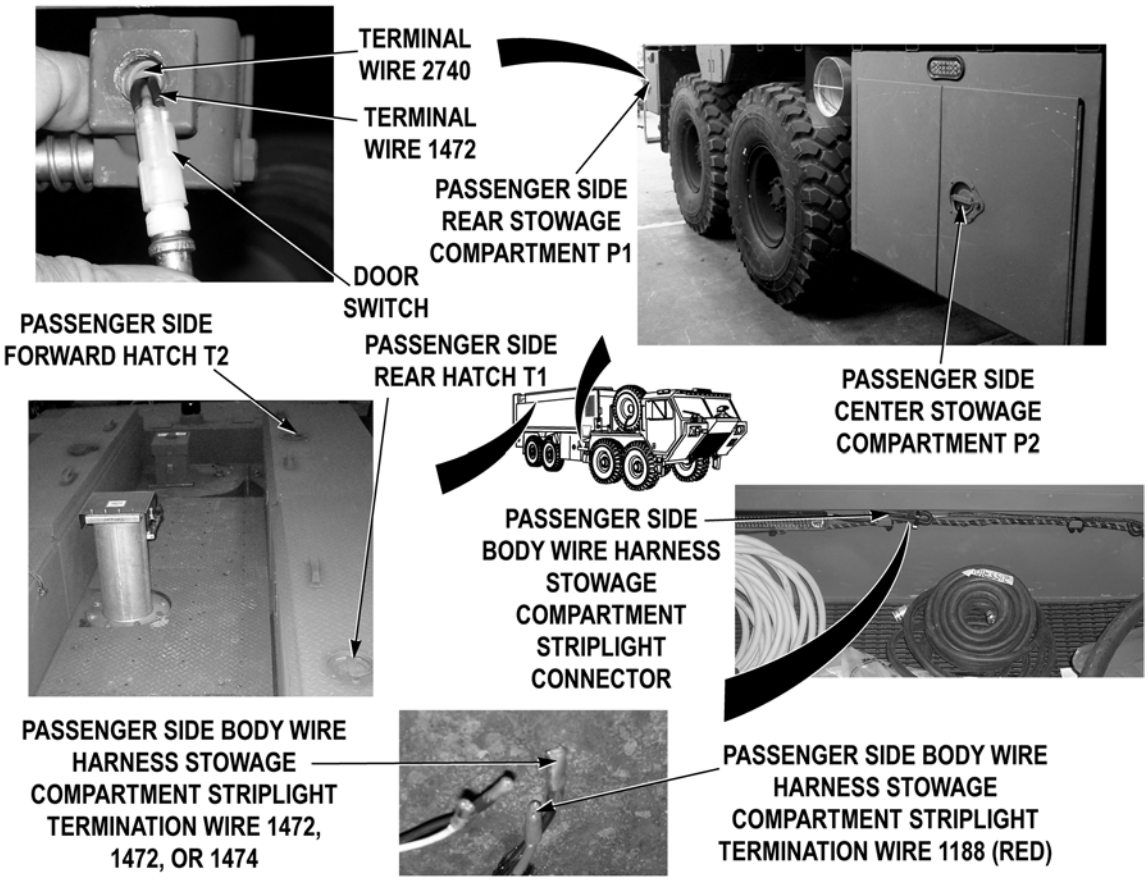


Step 11. Disconnect main wire harness passenger side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2740 (black) from main wire harness passenger side body wire harness connector, terminals D and E to a known good ground.

a. If there is continuity at both terminals, repair wire 2740 in passenger side body wire harness if repairable (TM 9-2320-315-14&P),or replace passenger side body wire harness (WP 0299).

b. If there is no continuity at either terminal, repair wire 2740 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293.)

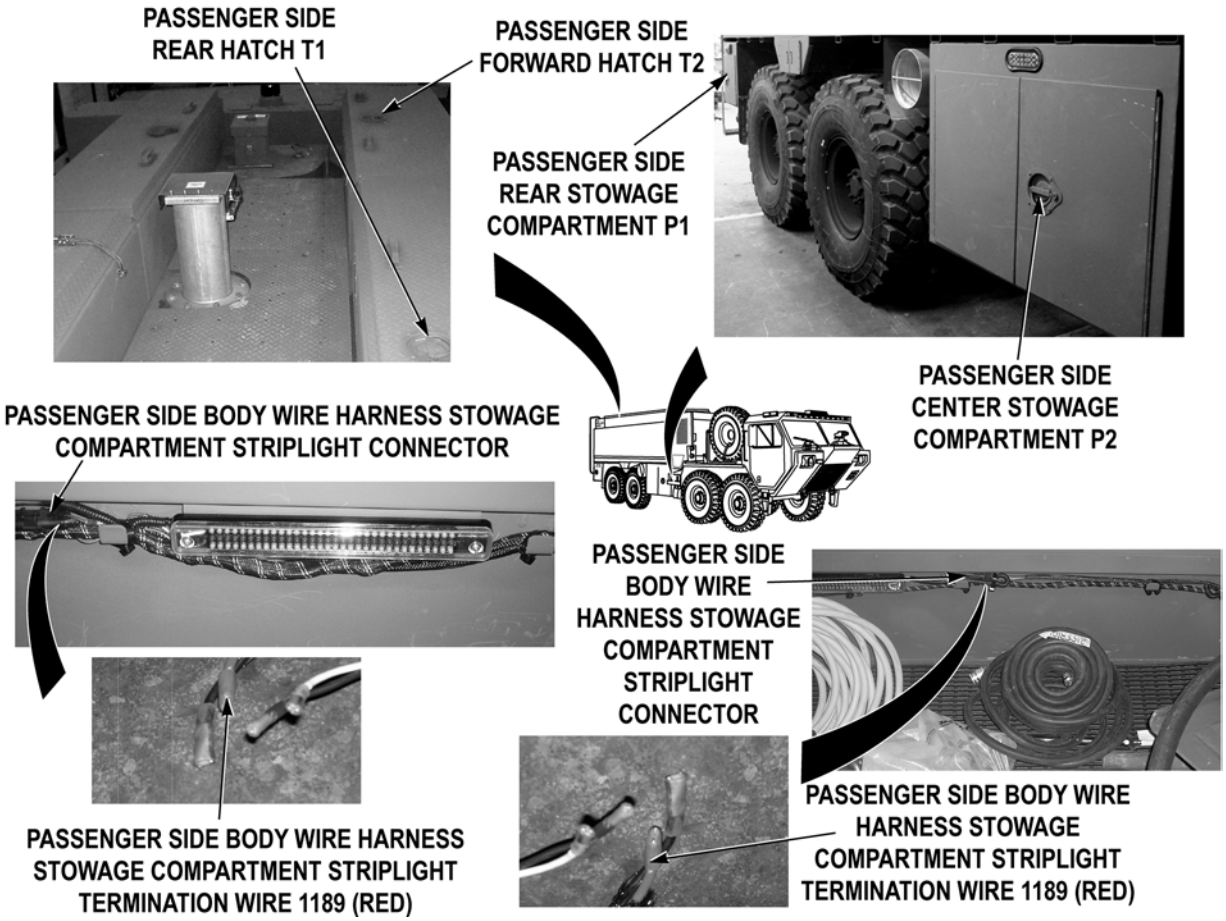
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Remove non-operating stowage compartment striplight (WP 0213). Cut passenger side body wire harness stowage compartment striplight butt splice connector wire 1472, 1473, or 1474 (black). Check for continuity across passenger side body wire harness wire 1472, 1473, or 1474 (black) from stowage compartment striplight connector termination to the associated door switch connector.

If there is no continuity, repair wire 1472, 1473, or 1474 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

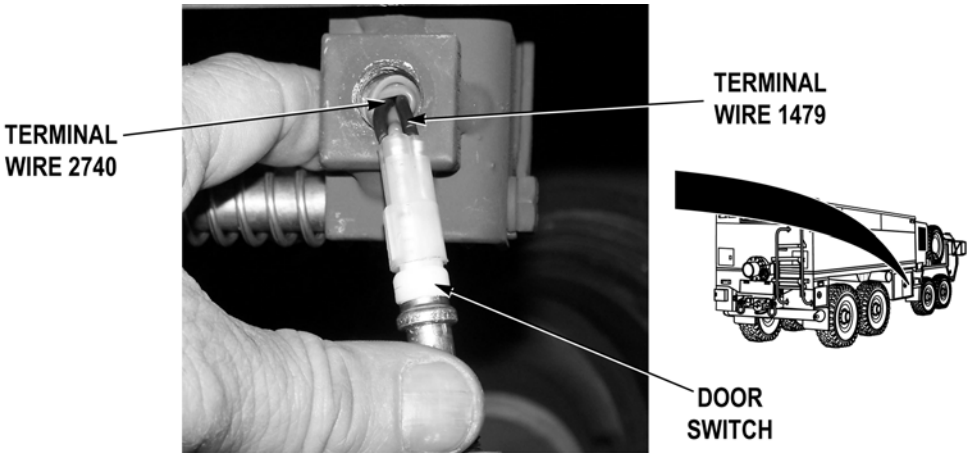


Step 13. Cut passenger side body wire harness stowage compartment striplight butt splice connector wire 1189 (red). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between wire 1189 (red) at passenger side body wire harness stowage compartment striplight connector termination and a known good ground.

a. If 22 to 28 VDC are present, replace non-operating stowage compartment striplight (WP 0213).

b. If 22 to 28 VDC are not present, repair wire 1189 in passenger side body wire harness if repairable (TM 9-2320-315-14&P), or replace passenger side body wire harness (WP 0299).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

NOTE

If wire 1479 cannot be identified at door switch, measure continuity between both black wire terminals to ground. Continuity should be measured between all terminals, when switch is closed (door switch is not pressed).

Step 14. Turn Service Drive Lights Off (TM 9-2320-279-10). Pull battery disconnect switch to off position (WP 0007). Close all rear doors and hatches except passenger side center stowage compartment P2 (WP 0008). Remove passenger side center stowage compartment P2 door switch (WP 0245). Do not disconnect wires. Check for continuity between door switch terminal wire 1479 (black) and a known good ground when switch is closed (door switch is not pressed).

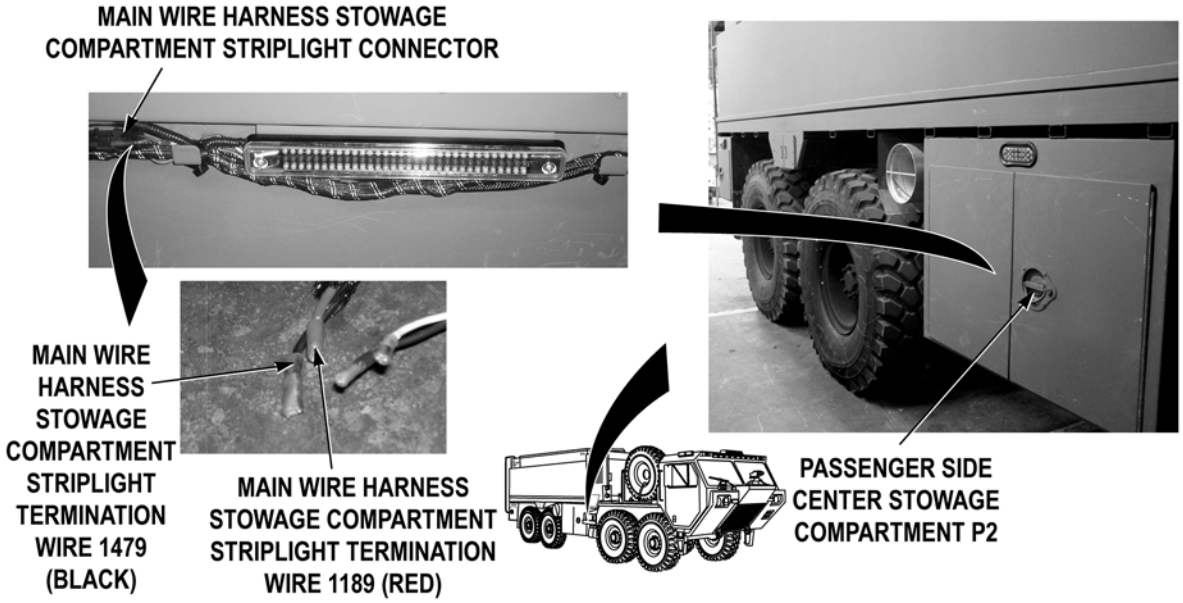
If there is continuity, go to Step 16.

Step 15. Check for continuity across door switch between terminal wire 1479 (black) and terminal wire 2740 (black).

a. If there is continuity, repair wire 2740 in main wire harness if repairable, (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, replace door switch (WP 0245).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Remove non-operating passenger side center stowage compartment P2 stowage compartment striplight (WP 0213). Cut main wire harness stowage compartment striplight butt splice connector wire 1479 (black). Check for continuity across main wire harness wire 1479 (black) from stowage compartment striplight connector termination to passenger side center stowage compartment P2 door switch connector.

If there is no continuity, repair wire 1479 in main wire harness if repairable (TM 9-2320-315-14&P) or replace main wire harness (WP 0293).

Step 17. Cut main wire harness passenger side center stowage compartment P2 stowage compartment striplight butt splice connector wire 1189 (red). Push battery disconnect switch to on position (WP 0007). Turn Service Drive Lights On (TM 9-2320-279-10). Check for 22 to 28 VDC between wire 1189 (red) at main wire harness passenger side center stowage compartment P2 stowage compartment striplight connector termination and a known good ground.

a. If 22 to 28 VDC are present, replace passenger side stowage compartment striplight (WP 0213).

b. If 22 to 28 VDC are not present, repair wire 1189 (red) in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP HOUSE OR PUMP OPERATOR'S PANEL STRIPLIGHT(S) DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

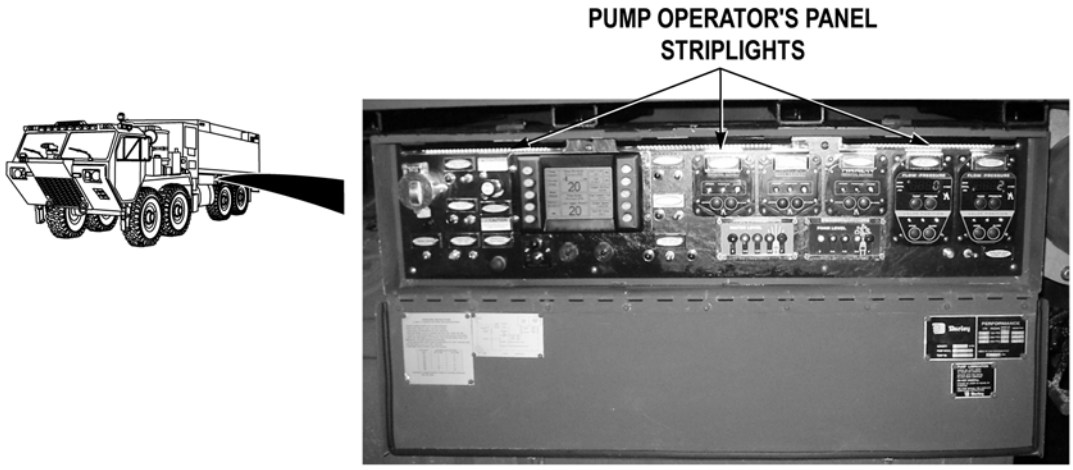
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0010
WP 0203
WP 0205
WP 0213

References (continued)
WP 0218
WP 0240
WP 0280
WP 0293
WP 0303
WP 0304

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PUMP HOUSE OR PUMP OPERATOR'S PANEL STRIPLIGHT(S) DOES NOT OPERATE



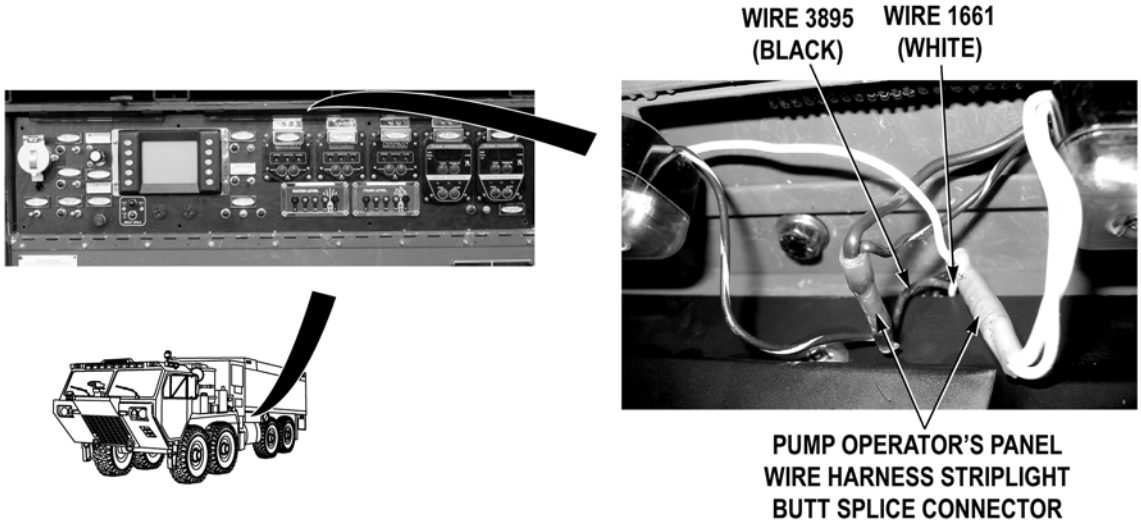
Step 1. Push battery disconnect switch to on position (WP 0007). Open pump operator's panel cover (WP 0010). Put pump operator's panel PANEL LIGHTS switch to on position (WP 0004). Check if all pump operator's panel striplights operate.

If all pump operator's panel striplights operate, go to Step 5.

Step 2. Check if any pump operator's panel striplights operate.

If all pump operator's panel striplights do not operate, go to Step 14.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 3. Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Cut wire 1661 (black) in pump operator's panel wire harness striplight butt splice connector from non-operating pump operator's panel striplight. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump operator's panel wire harness wire 1661 (black) at striplight butt splice connector termination and known good ground.

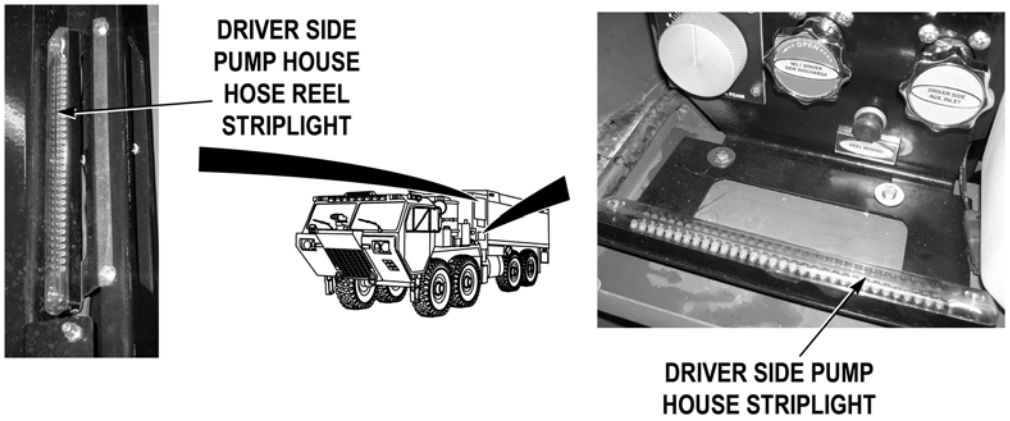
If 22 to 28 VDC are not present, repair wire 1661 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

Step 4. Put pump operator's panel PANEL LIGHTS switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Cut wire 3895 (black) in pump operator's panel wire harness striplight butt splice connector from non-operating pump operator's panel striplight. Check for continuity across pump operator's panel wire harness wire 3895 (black) from striplight butt splice connector termination to a known good ground.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

a. If there is continuity, replace non-operating pump operator's panel striplight (WP 0213).

b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).



Step 5. Open pump house access door assembly (WP 0009). Open driver side pump house control access door (WP 0008). Check if both driver side pump house striplights operate.

If driver side pump house striplights do not operate, go to Step 8.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 6. Disconnect pump house wire harness passenger side striplight connector. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 1661 (black) at striplight connector, terminal A and a known good ground.

If 22 to 24 VDC are not present, repair wire 1661 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 7. Put pump operator's panel PANEL LIGHTS switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump house wire harness wire 2740 (black) from passenger side striplight connector, terminal B to a known good ground.

a. If there is continuity, replace passenger side pump house striplight (WP 0213).

b. If there is no continuity, repair wire 2740 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

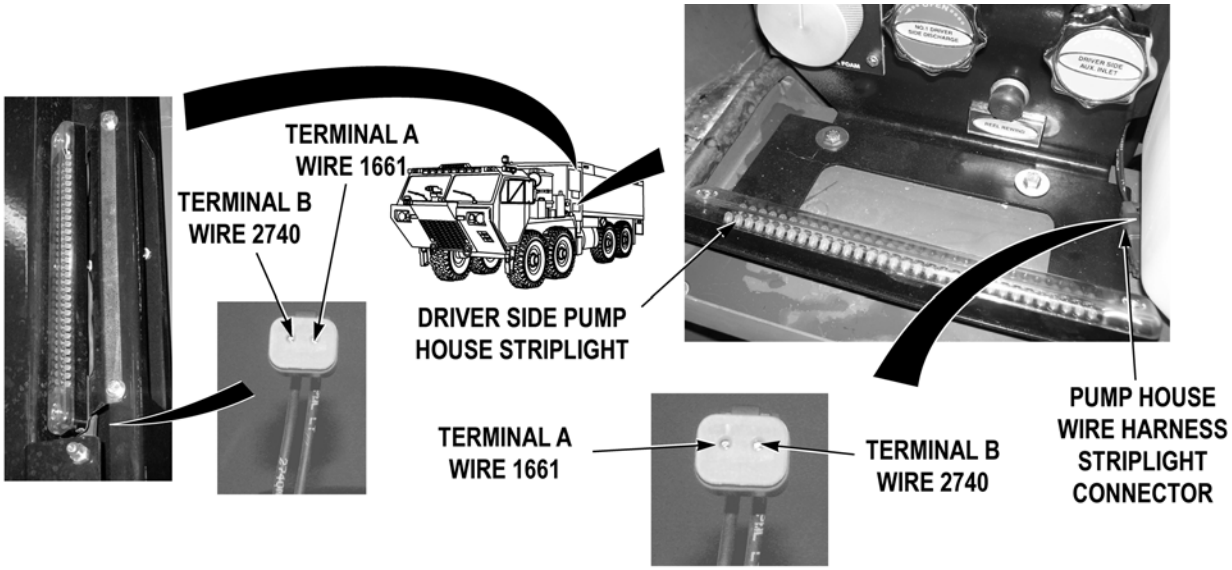
NOTE

Step 8 will check if pump house wire harness is receiving power. If passenger side pump house striplight operate, Step 9 and Step 10 will assist in determining where power is lost to driver side striplights.

Step 8. Open passenger side pump house control access door (WP 0008). Check if passenger side pump house striplight operates.

If passenger side pump house striplight does not operate, go to Step 11.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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Step 9. Disconnect pump house wire harness striplight connector from either driver side pump house striplight. With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 1661 (black) at driver side striplight connector, terminal A and a known good ground.

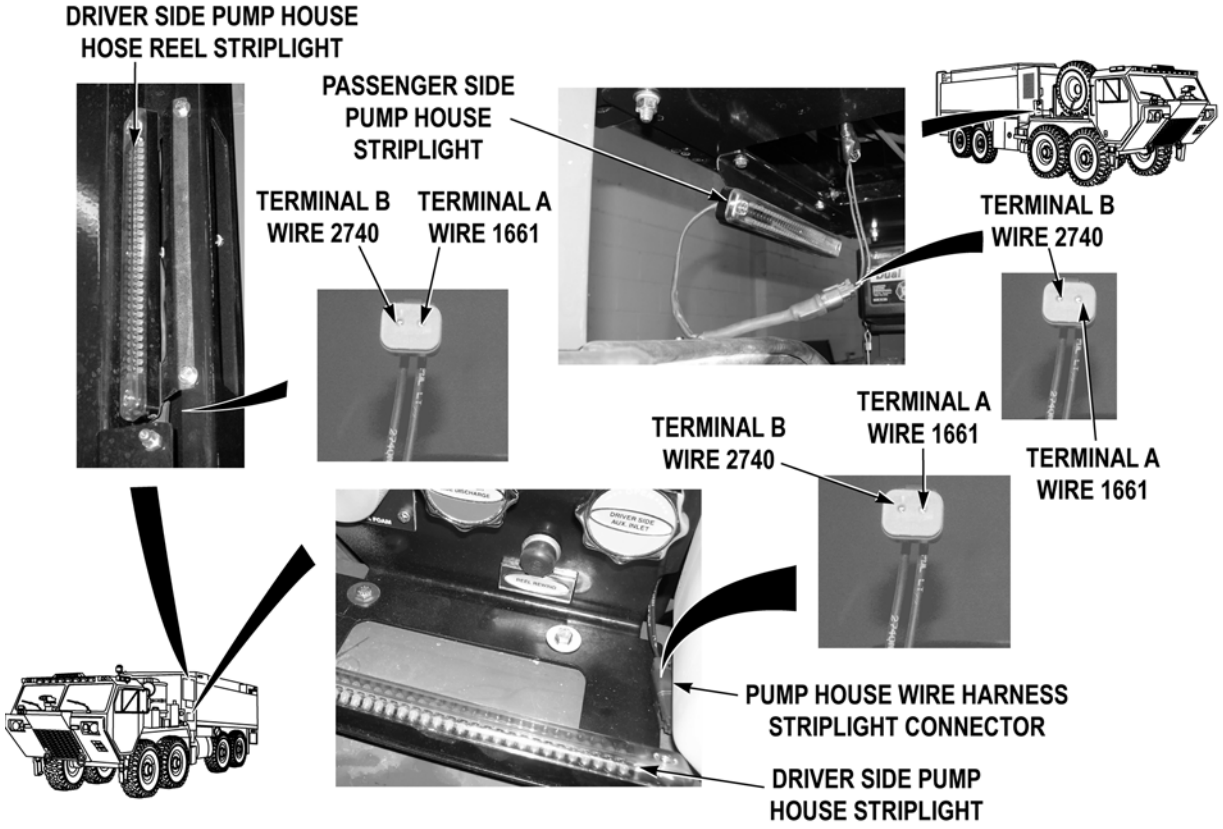
If 22 to 28 VDC are not present, repair wire 1661 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 10. Put pump operator's panel PANEL LIGHTS switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump house wire harness wire 2740 (black) from driver side striplight connector, terminal B to a known good ground.

a. If there is continuity, replace pump house striplight (WP 0213).

b. If there is no continuity, repair wire 2740 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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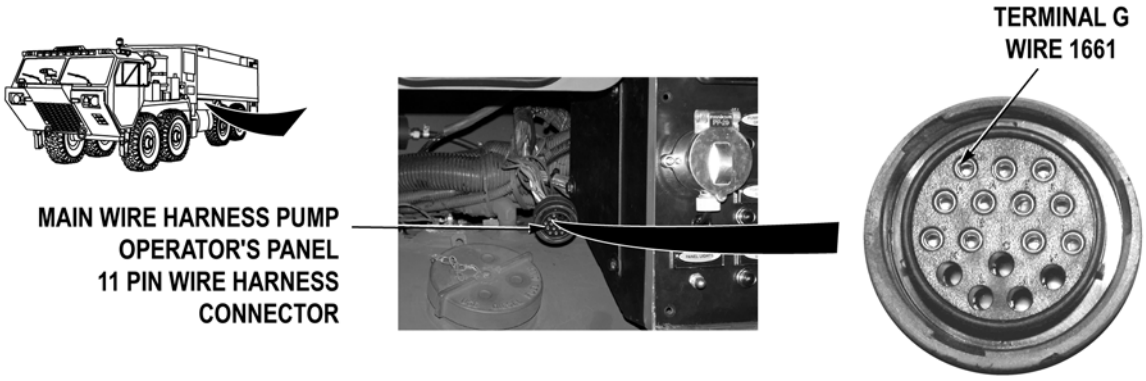
Step 11. Put pump operator's panel PANEL LIGHTS switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect any pump house striplight connector. With a lead test set, check for continuity across pump house wire harness wire 2740 (black) from striplight connector, terminal B to a known good ground.

If there is no continuity, repair wire 2740 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

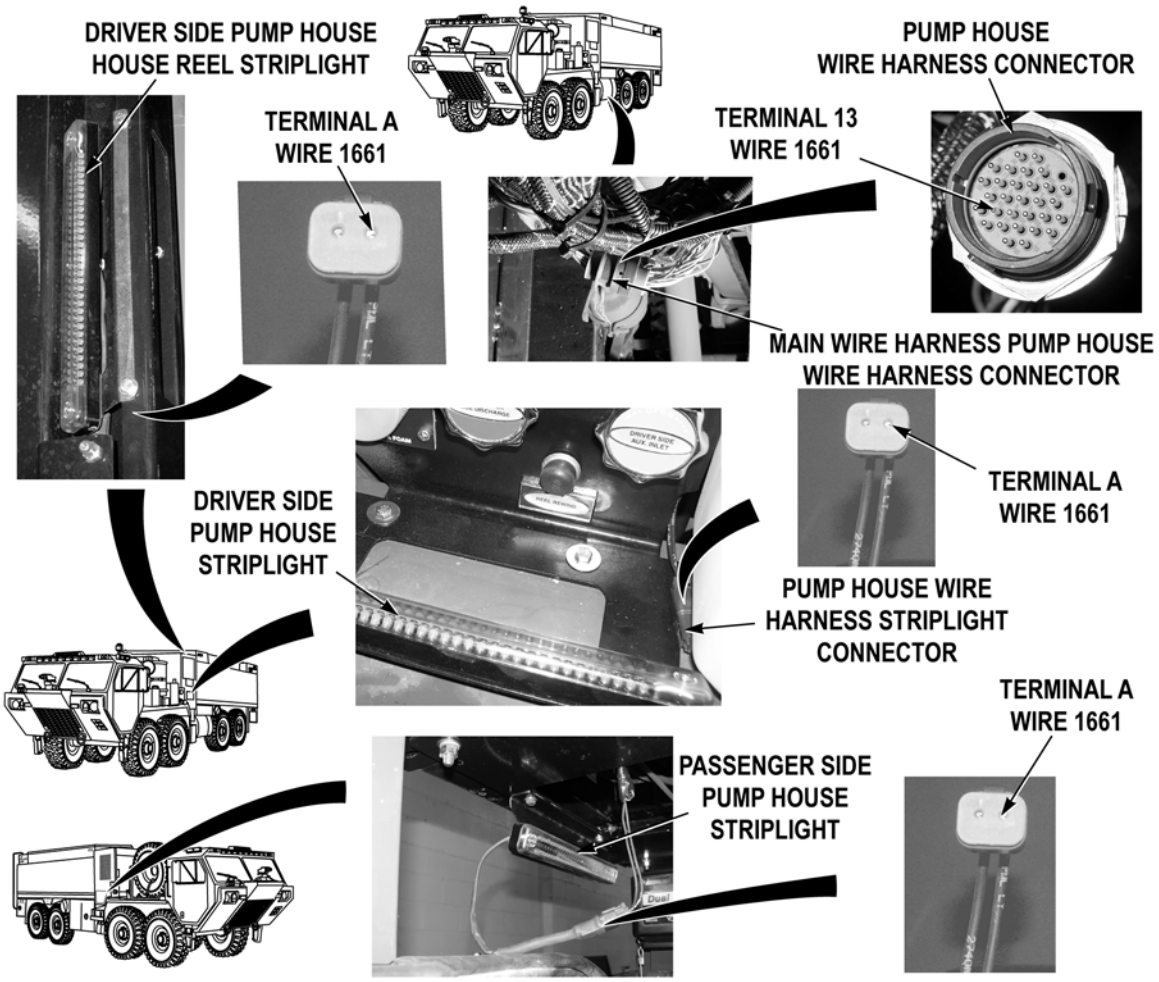
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Disconnect main wire harness pump operator’s panel 11 pin wire harness connector. With a test lead set, check for continuity across wire 1661 (black) from main wire harness pump operator’s panel 11 pin wire harness connector, terminal G to disconnected pump house wire harness striplight connector, terminal A.

If there is continuity, repair wire 1661 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 1661 (black) from pump house wire harness connector, terminal 13 to striplight connector, terminal A.

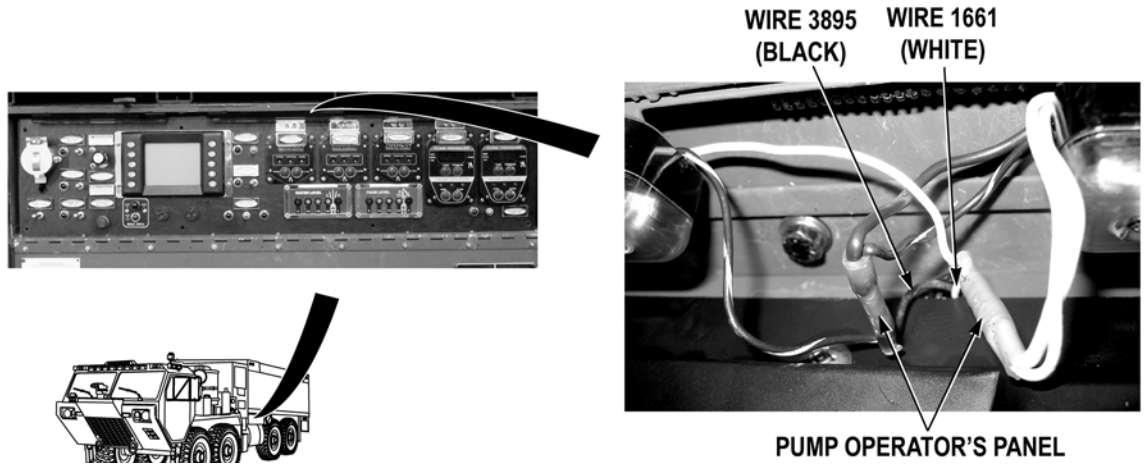
a. If there is continuity, repair wire 1661 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 1661 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

Step 14. Check if pump house striplights operate.

If pump house striplights do not operate, go to Step 16.

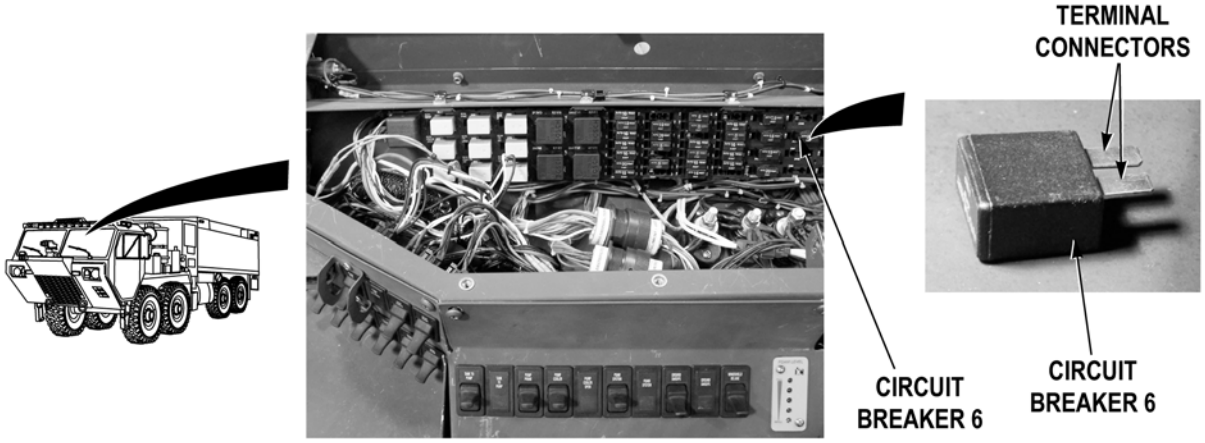
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 15. Put pump operator's panel PANEL LIGHTS switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Open pump operator's panel (WP 0205). Disconnect pump operator's panel wire harness striplight connector. With a test lead set, check for continuity across pump operator's panel wire harness wire 3895 (black) from striplight connector terminal B, to a known good ground.

a. If there is continuity, repair wire 1661 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

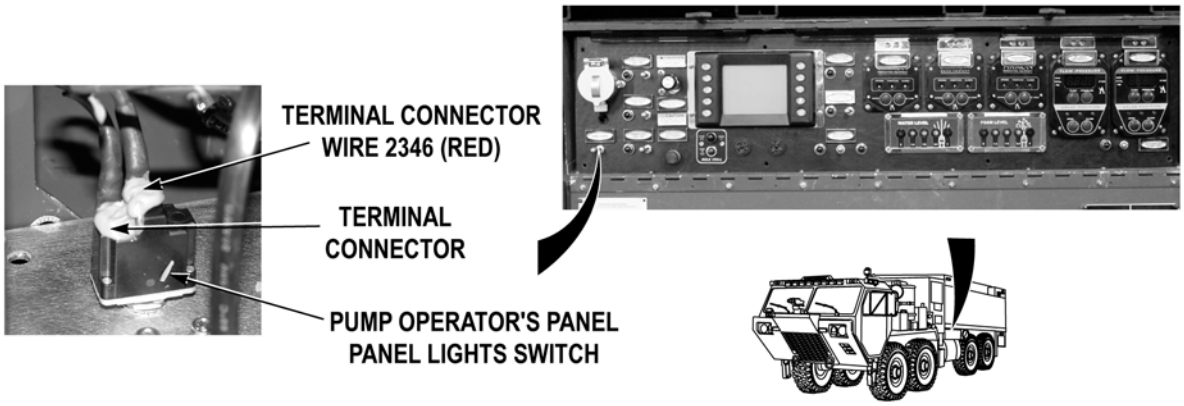
b. If there is no continuity, repair wire 3895 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).



Step 16. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 6 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker 6 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 17. Install circuit breaker 6 (WP 0240). Open pump operator's panel (WP 0205). Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between pump operator's panel wire harness wire 2346 (red) at PANEL LIGHTS switch terminal connector, and a known good ground.

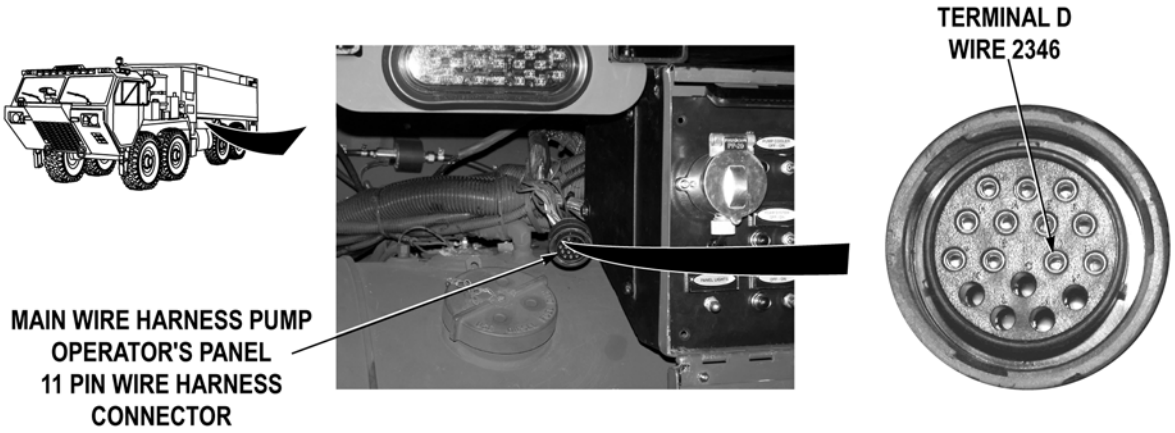
If 22 to 28 VDC are not present, go to Step 19.

Step 18. Pull battery disconnect switch to off position (WP 0007). Check for continuity across PANEL LIGHTS switch from terminal connector to terminal connector, when switch is put to on position.

a. If there is continuity, repair wire 1661 in pump operator's panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator's panel wire harness (WP 0304).

b. If there is no continuity, replace PANEL LIGHTS switch (WP 0218).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



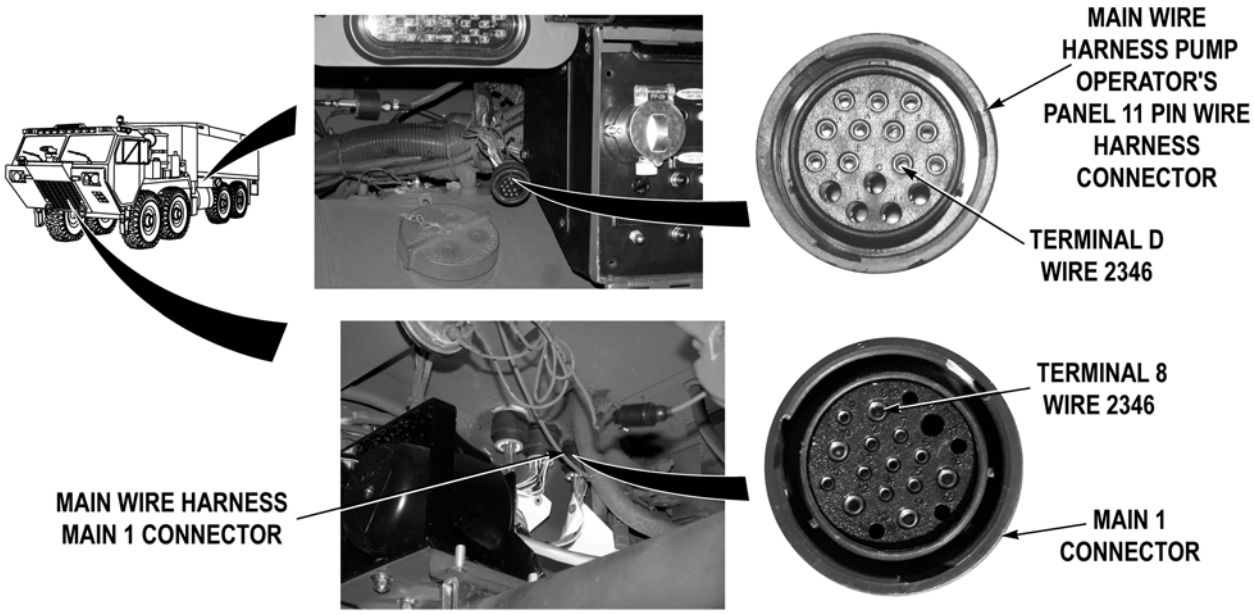
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 19. Disconnect main wire harness pump operator’s panel 11 pin wire harness connector. With a test lead set, check for 22 to 28 VDC between main wire harness wire 2346 (red) at main wire harness pump operator’s panel 11 pin wire harness connector, terminal D and a known good ground.

If 22 to 28 VDC are present, repair wire 2346 in pump operator’s panel wire harness if repairable (TM 9-2320-315-14&P), or replace pump operator’s panel wire harness (WP 0304).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 20. Pull battery disconnect switch to off position (WP 0007). Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 2346 (red) from main 1 connector, terminal 8 to main wire harness pump operator's panel 11 pin wire harness connector, terminal D.

a. If there is continuity, repair wire 2346 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 2346 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

REAR STEP BUZZER AUDIO ALARM DOES NOT OPERATE

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0199
WP 0200
WP 0201

References (continued)
WP 0203
WP 0240
WP 0265
WP 0280
WP 0287
WP 0293

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

REAR STEP BUZZER AUDIO ALARM DOES NOT OPERATE

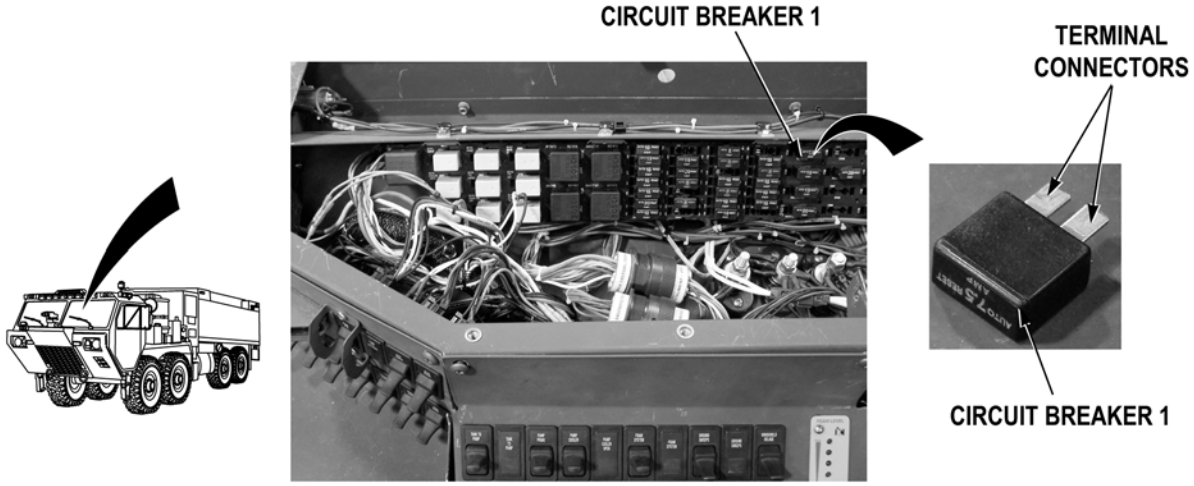
Step 1. Push battery disconnect switch to on position (WP 0007). While an assistant pushes rear step buzzer push button, check if rear step buzzer audio alarm operates (WP 0004).

If rear step buzzer alarm operates, go to Step 9.

Step 2. While an assistant pushes rear step buzzer push button, check if rear step buzzer indicator illuminates.

If rear step buzzer indicator illuminates go to Step 11.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



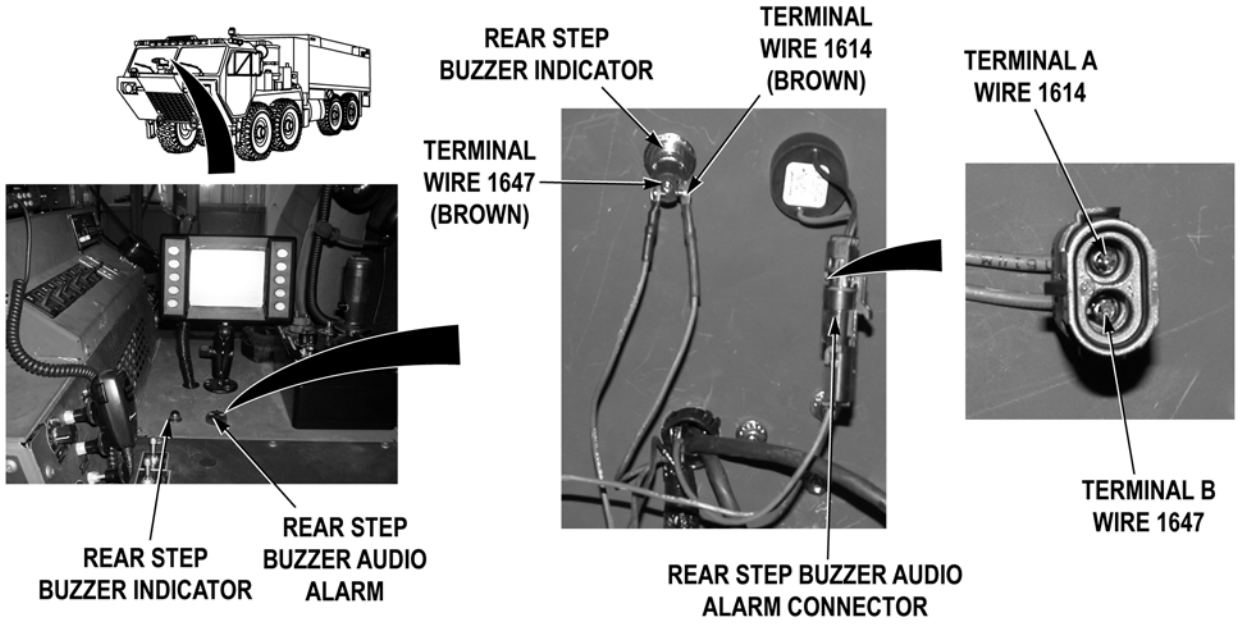
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 3. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 1 (WP 0240). Check for continuity across circuit breaker from terminal to terminal.

If there is no continuity, replace circuit breaker 1 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



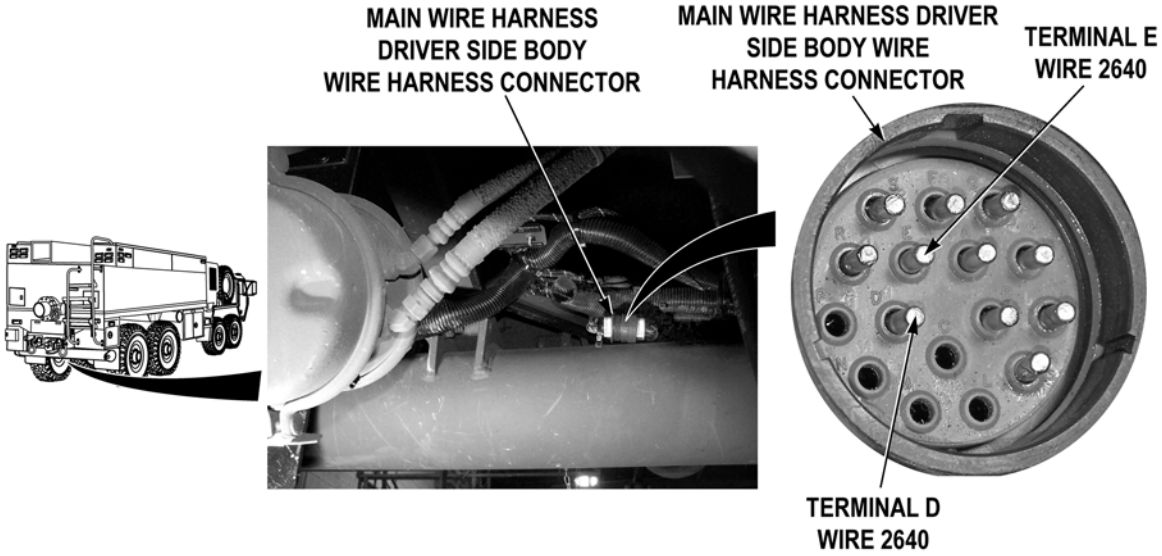
NOTE

Rear step buzzer indicator and audio alarm connectors are in contact with two separate wire harnesses. Wire 1647 (brown) originates at cab power distribution wire harness and introduces power into the circuit. Wire 1614 (brown) originates at main wire harness and leads to rear step buzzer push button assembly. When rear step buzzer push button assembly is pushed, a ground is applied to circuit, completing circuit.

Step 4. Install circuit breaker 1 (WP 0240). Remove cab instrument panel D (WP 0203). Push battery disconnect switch to on position (WP 0007). Disconnect rear step buzzer audio alarm connector. With a test lead set, check for 22 to 28 VDC between cab power distribution wire harness wire 1647 (brown) at rear step buzzer audio alarm connector, terminal B and a known good ground.

If 22 to 28 VDC are not present, repair wire 1647 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



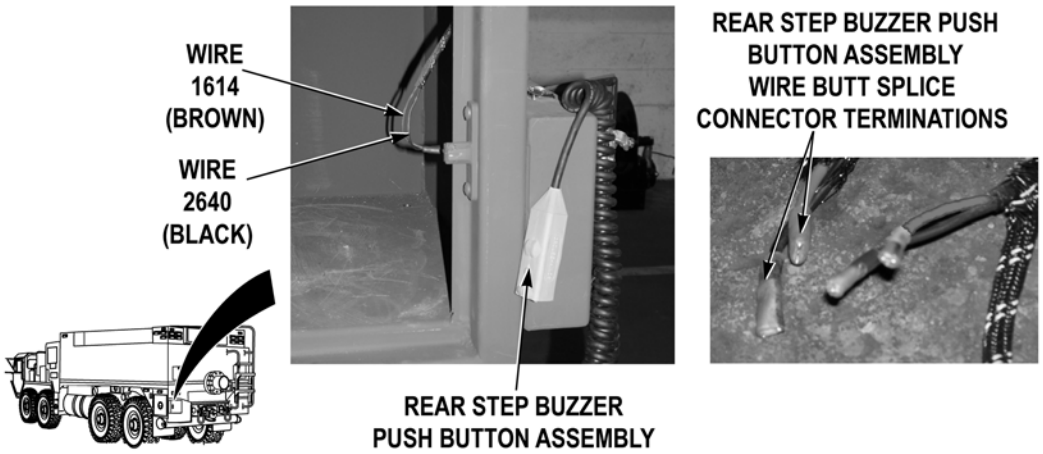
Step 5. Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness driver side body wire harness connector. With a test lead set, check for continuity across main wire harness wire 2640 (black) from driver side body wire harness connector, terminals D and E to a known good ground.

If there is no continuity at either terminal, repair wire 2640 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 6. While an assistant pushes rear step buzzer push button (WP 0004), with a test lead set, check for continuity between main wire harness driver side body wire harness connector, terminals B and D, and then B and E.

If there is continuity between terminals B and D or B and E, repair wire 1614 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

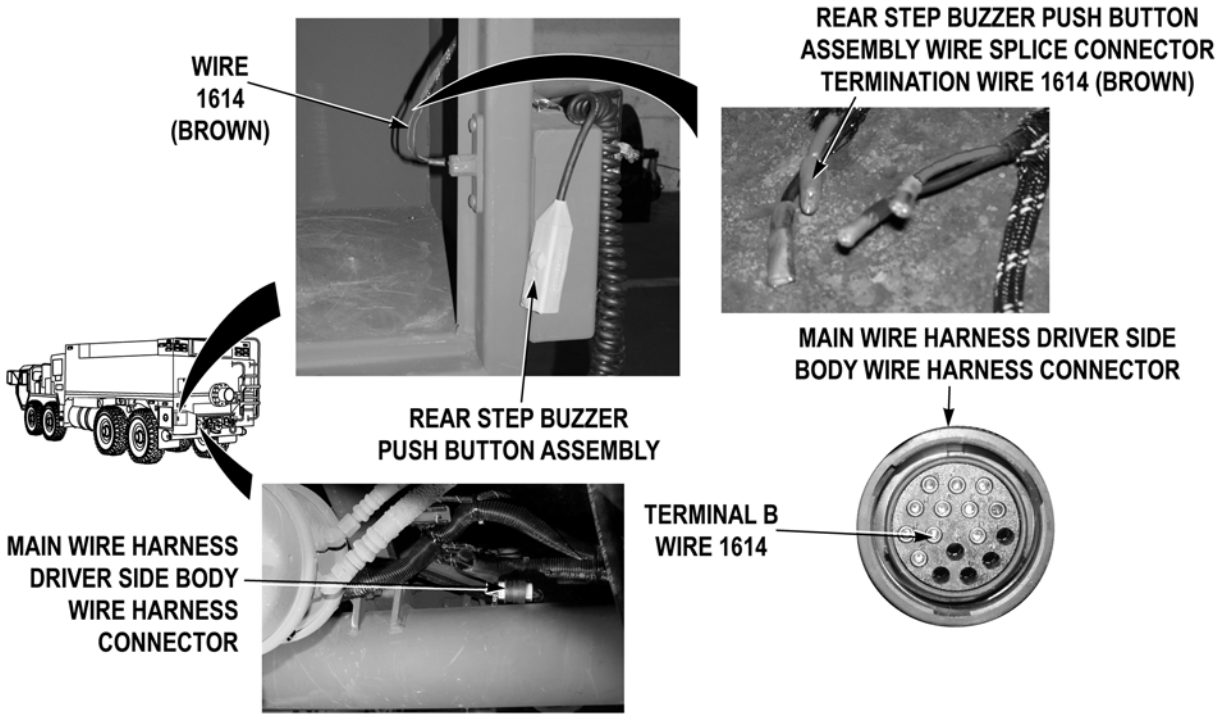
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Cut driver side body wire harness wires 1614 (brown) and 2640 (black) at rear step buzzer push button assembly wire butt splice connectors (WP 0265). While an assistant pushes rear step buzzer push button (WP 0004), check for continuity across rear step buzzer push button assembly from wire 1614 (brown) to wire 2640 (black) butt splice connector terminations.

If there is no continuity, replace rear step buzzer push button assembly (WP 0265).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

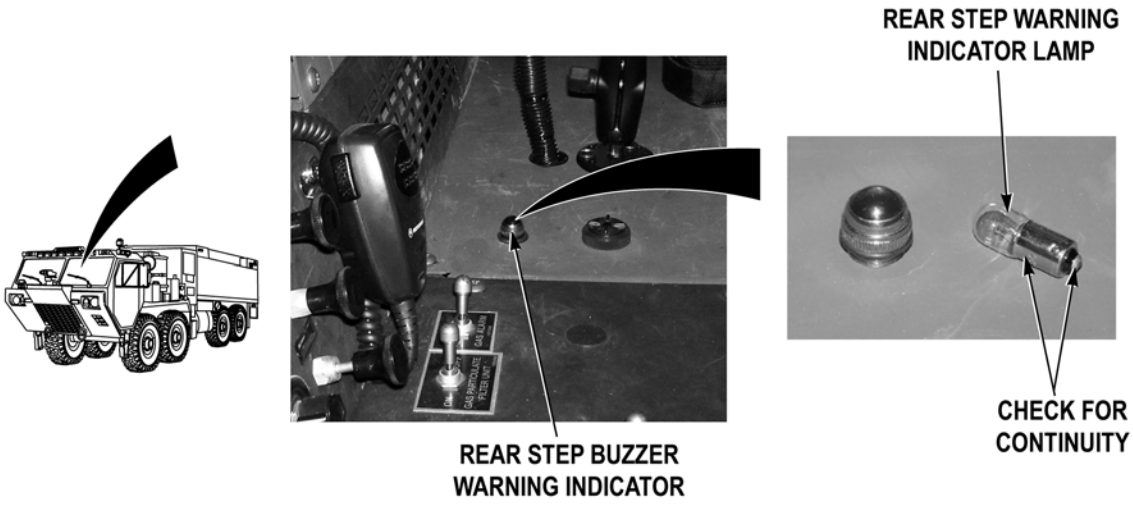


Step 8. With a test lead set, check for continuity across driver side body wire harness wire 1614 (brown) from main wire harness driver side body wire harness connector, terminal B to rear step buzzer push button assembly wire butt splice connector termination.

a. If there is continuity, repair wire 2640 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

b. If there is no continuity, repair wire 1614 in driver side body wire harness if repairable (TM 9-2320-315-14&P), or replace driver side body wire harness (WP 0287).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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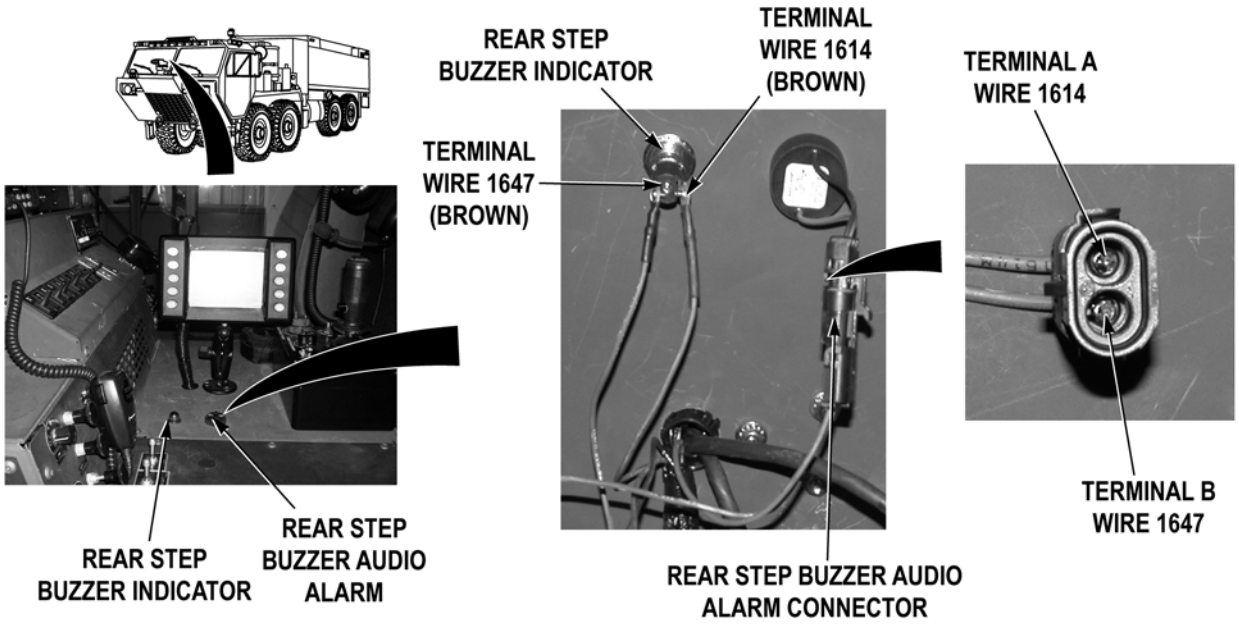
Step 9. Pull battery disconnect switch to off position (WP 0007). Remove rear step buzzer indicator lamp (WP 0200). Check for continuity across lamp.

If there is no continuity, replace lamp (WP 0200).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 10. Remove cab instrument panel D (WP 0203). Disconnect rear step buzzer audio alarm connector. With a test lead set, check for continuity across cab power distribution wire harness wire 1647 (brown) from rear step buzzer audio alarm connector, terminal B to rear step buzzer indicator terminal.

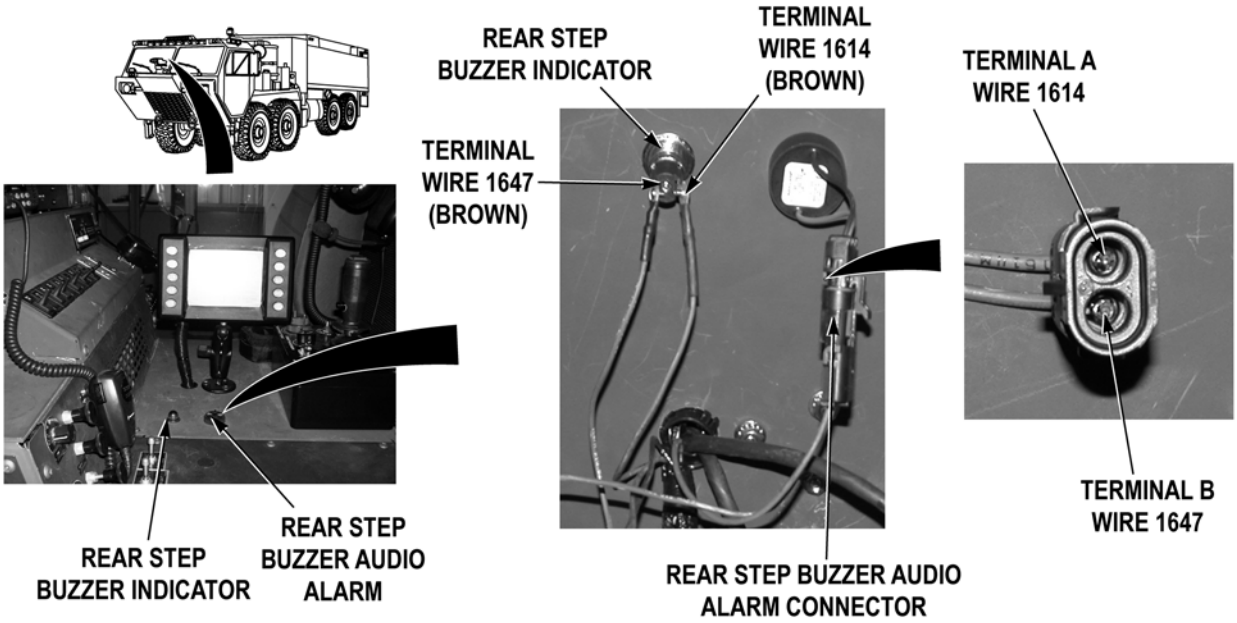
If there is no continuity, repair wire 1647 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

Step 11. With a test lead set, check for continuity across main wire harness wire 1614 (brown) from rear step buzzer audio alarm connector, terminal A to rear step buzzer indicator terminal.

a. If there is continuity, replace rear step buzzer indicator (WP 0199).

b. If there is no continuity, repair wire 1614 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel D (WP 0203). Disconnect rear step buzzer audio alarm connector. With a test lead set, check for continuity across cab power distribution wire harness wire 1647 (brown) from rear step buzzer audio alarm connector, terminal B to rear step buzzer indicator terminal.

If there is no continuity, repair wire 1647 in cab distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

Step 13. With a test lead set, check for continuity across main wire harness wire 1614 (brown) from rear step buzzer audio alarm connector, terminal A to rear step buzzer indicator terminal.

a. If there is continuity, replace rear step buzzer indicator (WP 0201).

b. If there is no continuity, repair wire 1614 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

SINCGARS DO NOT OPERATE PROPERLY

INITIAL SETUP:

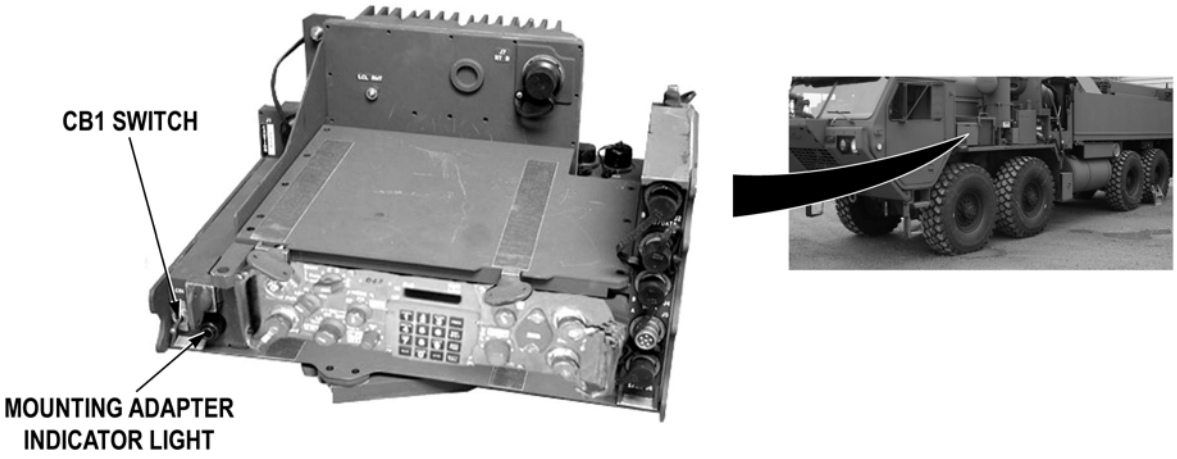
Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

References
TM 11-5280-890-10
WP 0004
WP 0007
WP 0117
WP 0271

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
SINCGARS DO NOT OPERATE PROPERLY		

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Make sure that mounting adapter indicator lens is turned fully left (counterclockwise) before Step 1.

Step 1. Push battery disconnect switch to on position (WP 0007). Put mounting adapter CB1 switch to ON position (TM 9-2320-279-10). Check if mounting adapter indicator light illuminates.

If indicator light does not illuminate, go to Step 3.

NOTE

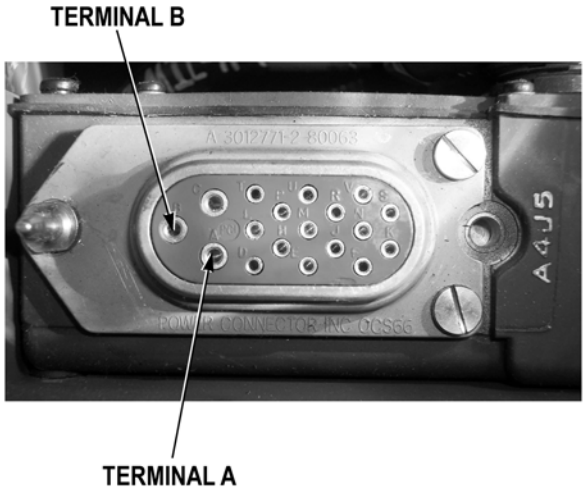
Mounting adapter indicator light will blink for approximately 3 seconds, then stay illuminated if mounting adapter is operating properly.

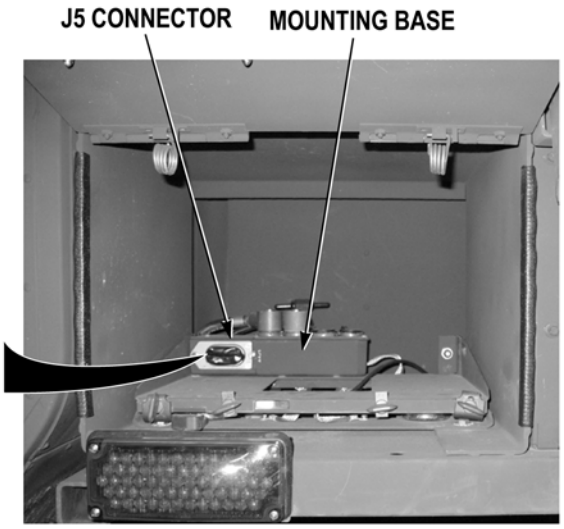
Step 2. Put mounting adapter CB1 switch to OFF, then back to ON position (TM 9-2320-279-10). Check if mounting adapter indicator continues to blink after 3 seconds.

a. If mounting adapter indicator light continues to blink after 3 seconds, notify Supervisor.

b. If mounting adapter indicator light illuminates and stays continuously illuminated after 3 seconds, go to Step 7.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

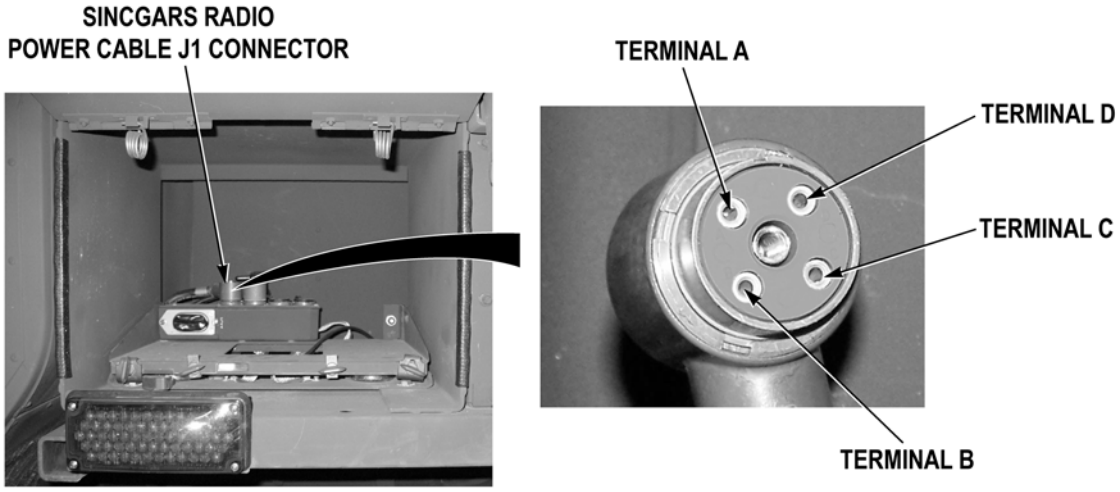
Step 3. Pull battery disconnect switch to off position (WP 0007). Put mounting adapter CB1 switch to OFF position (TM 11-5280-890-10). Remove SINCGARS receiver transmitter and mounting adapter from mounting base (WP 0271). With a test lead set, check for continuity across SINCGARS radio power cable and mounting base from mounting base J5 connector, terminal A and terminal B to a known good ground.

If there is no continuity at either terminal, go to Step 6.

Step 4. Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between mounting base J5 connector, terminal B and a known good ground.

If 22 to 28 VDC are present at mounting base J5 connector, notify Supervisor.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 5. Pull battery disconnect switch to off position (WP 0007). Disconnect SINCGARS power cable J1 connector from mounting base (TM 11-5280-890-10). Push battery disconnect switch to on position (WP 0007). With a test lead set, check for 22 to 28 VDC between SINCGARS power cable assembly J1 connector, terminals A and B and a known good ground.

a. If 22 to 28 VDC are present at both terminals, replace mounting base (WP 0271).

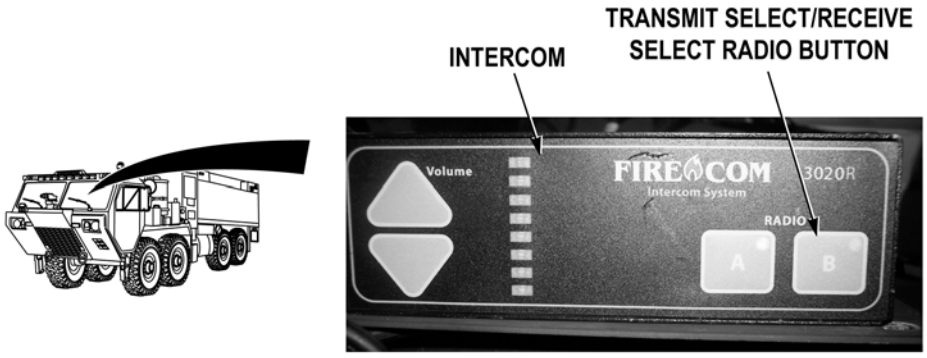
b. If 22 to 28 VDC are not present at either terminal, replace SINCGARS power cable assembly (WP 0259).

Step 6. With a test lead set, check for continuity across SINCGARS radio power cable ground wire, from SINCGARS power cable assembly J1 connector, terminals C and D to a known good ground.

a. If there is continuity at both terminals, replace mounting base (WP 0271).

b. If there is no continuity at either terminal, replace SINCGARS power cable assembly (WP 0259).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 7. Press intercom transmit select/receive RADIO B button (WP 0004). With intercom headset connected to pump operator's panel intercom jack (WP 0004), check if intercom system sends and receives through SINCGARS radio set (WP 0004).

If intercom system sends and receives through SINCGARS radio set, fault corrected.

Step 8. Connect handset to SINCGARS receiver transmitter (TM 11-5280-890-10). Check if SINCGARS receiver transmitter sends and receives to and from another radio set.

a. If SINCGARS receiver transmitter sends and receives to and from another radio set, troubleshoot Intercom and Headsets Does Not Operate Properly (WP 0117).

b. If SINCGARS receiver transmitter does not send and receive to and from another radio set, notify Supervisor.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

SIREN DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0102
WP 0203
WP 0240

References (continued)
WP 0272
WP 0280
WP 0293
WP 0381
WP 0401

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

SIREN DOES NOT OPERATE PROPERLY

Step 1. Push battery disconnect switch to on position (WP 0007). Put EMERG MASTER switch to on position (WP 0004). Put siren control selector switch to WAIL, YELP, and HI-LO (WP 0004). Check if siren operates.

If siren operates in at least one mode, but not all, replace siren control (WP 0381).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

NOTE

Integrated siren amplifier will produce a faint audible signal which can be heard at siren control if siren speaker or wiring fails.

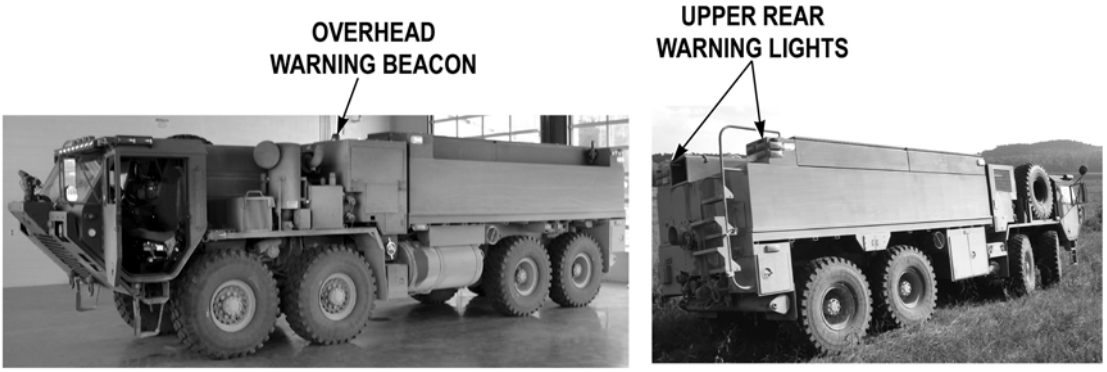
Step 2. Put siren control selector switch to WAIL, YELP, and HI-LO (WP 0004). Check if siren output can be heard at siren control.

If siren is heard faintly at siren control, go to Step 11.

Step 3. Check if siren speaker operates without distortion.

If siren operates with distortion, cut main wire harness wires 1052 (brown), and 1053 (yellow) at siren speaker butt splice connectors and swap wire connections, if distortion persists, replace siren speaker (WP 0401).

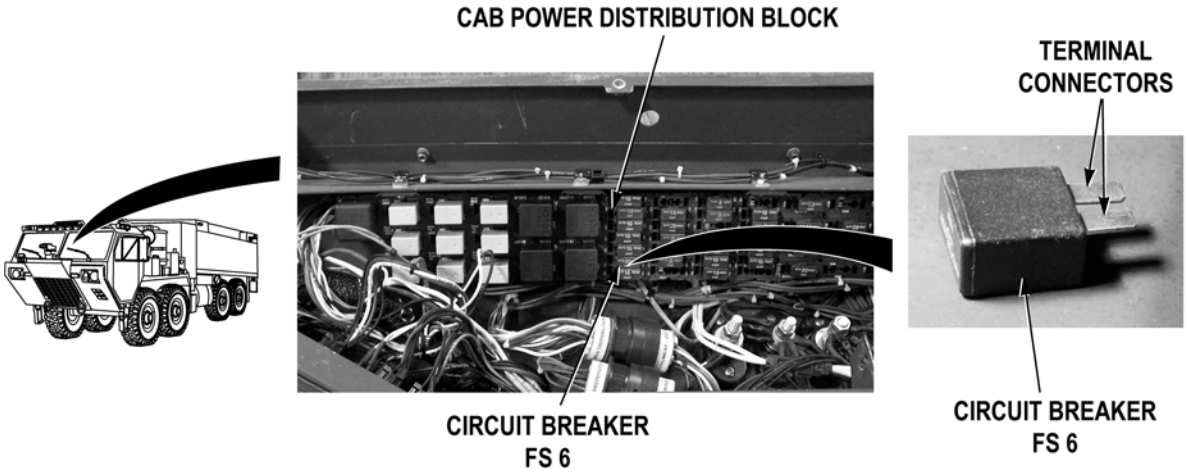
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Put OVERHEAD WARNING and UPPER REAR WARNING switches to on position (WP 0004). Check if overhead warning beacon and upper rear warning lights operate.

If overhead warning beacon and upper rear warning lights do not operate, troubleshoot Warning Lights (Overhead Beacon) Do Not Operate (WP 0102).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

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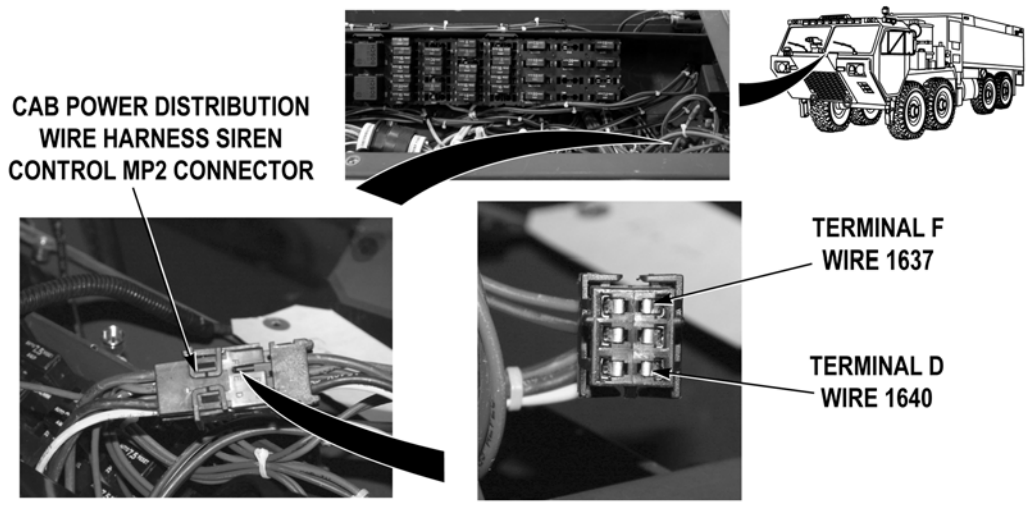
Step 5. Put OVERHEAD WARNING and UPPER REAR WARNING switches to off position (WP 0004). Put EMERG MASTER switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker FS 6 (WP 0240). Check for continuity across circuit breaker.

If there is no continuity, replace circuit breaker FS 6 (WP 0240).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 6. Install circuit breaker FS 6 (WP 0240). Disconnect cab power distribution wire harness siren control MP2 connector. Push battery disconnect switch to on position (WP 0007). Put EMERG MASTER switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between wire 1637 (red) at cab power distribution wire harness siren control MP2 connector, terminal F and a know good ground.

If 22 to 28 VDC are not present, repair wire 1637 in cab power distribution harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution harness (WP 0280).

Step 7. Pull battery disconnect switch to off position (WP 0007). Put EMERG MASTER switch to off position (WP 0004). With a test lead set, check for continuity across cab power distribution wire harness wire 1640 (black) from cab power distribution harness siren control MP2 connector, terminal D to a known good ground.

If there is no continuity, repair wire 1640 in cab power distribution wire harness (TM 9-2320-315-14&P), or replace cab power distribution wire harness (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

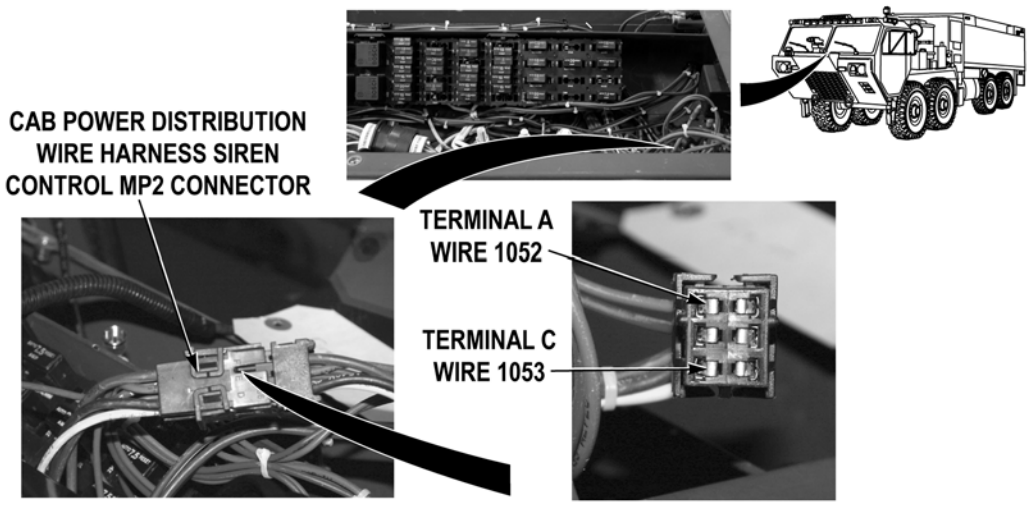
NOTE

Integrated siren amplifier will produce a faint audible signal which can be heard at siren control if siren speaker or wiring fails.

Step 8. Reconnect cab power distribution wire harness siren control MP2 connector. Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. Push battery disconnect switch to on position (WP 0007). Put EMERG MASTER switch to on position (WP 0004). Put siren control selector switch to WAIL, YELP, and HI-LO (WP 0004). Check if siren output can be heard at siren control.

If siren can be heard at siren control, go to Step 15.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Steps 9 and 10 checks cab power distribution wire harness wires 1052 (brown) and 1053 (orange) for a short to ground.

Step 9. Pull battery disconnect switch to off position (WP 0007). Put EMERG MASTER switch to off position (WP 0004). With a test lead set, check for continuity (short to ground) of power distribution wire harness wire 1052 (brown) from cab power distribution wire harness siren control MP2 connector, terminal A to a known good ground.

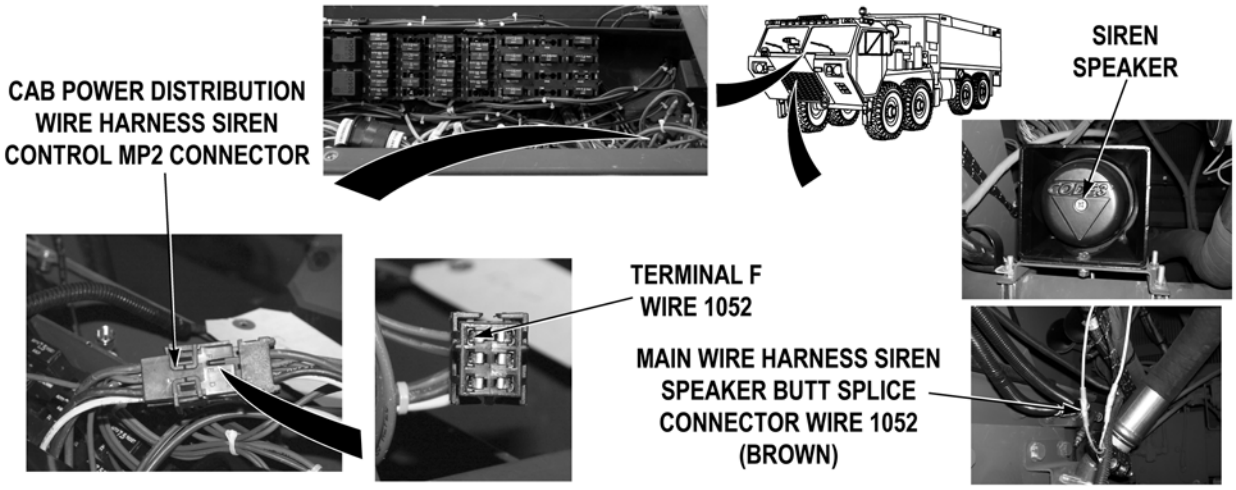
If there is continuity, repair wire 1052 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness (WP 0280).

Step 10. With a test lead set, check for continuity (short to ground) of power distribution wire harness wire 1053 (orange) from cab power distribution wire harness siren control MP2 connector, terminal C to a known good ground.

a. If there is continuity, repair wire 1053 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness (WP 0280).

b. If there is no continuity, replace siren control (WP 0381).

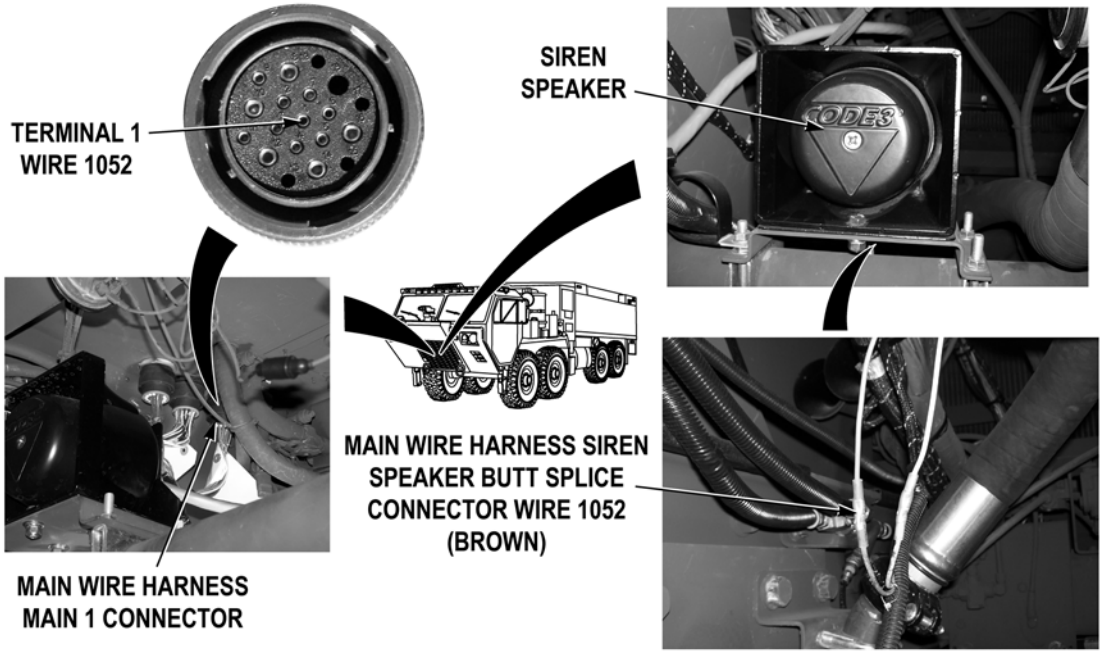
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 11. Pull battery disconnect switch to off position (WP 0007). Put EMERG MASTER switch to off position (WP 0004). Remove skid plate grille (WP 0350). Cut main wire harness siren speaker butt splice connector wire 1052 (brown) at siren speaker. Remove cab instrument panel A (WP 0203). Disconnect cab power distribution wire harness siren control MP2 connector. With a test lead set, check for continuity across wire 1052 (brown) from main wire harness siren speaker butt splice connector, termination to cab power distribution wire harness siren control MP2 connector, terminal A.

If there is continuity, go to Step 13.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

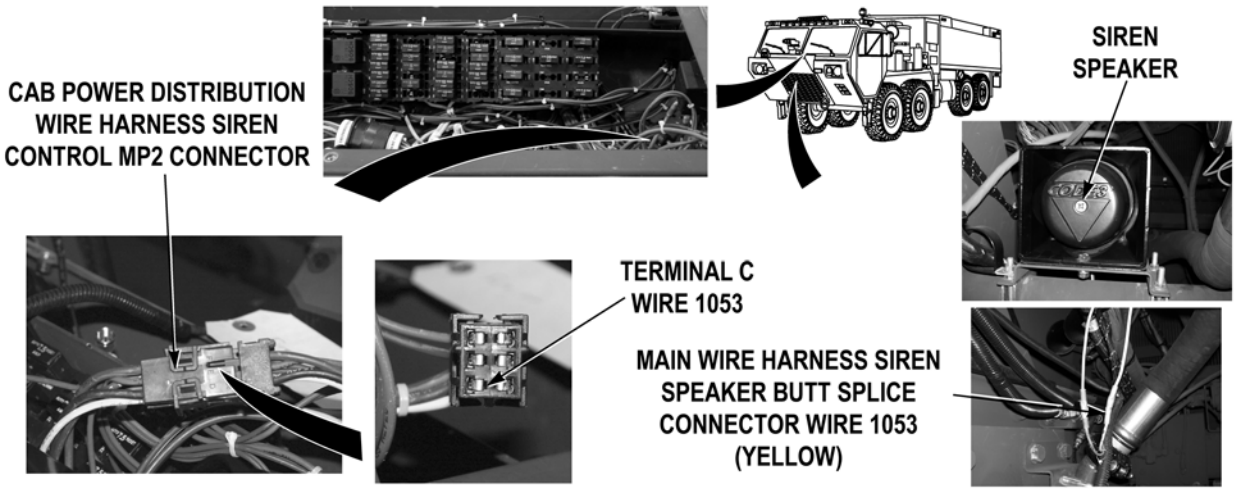


Step 12. Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across wire 1052 (brown), from main wire harness main 1 connector, terminal 1 to main wire harness siren speaker butt splice connector, termination.

a. If there is continuity, repair wire 1052 (brown) in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1052 (brown) in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

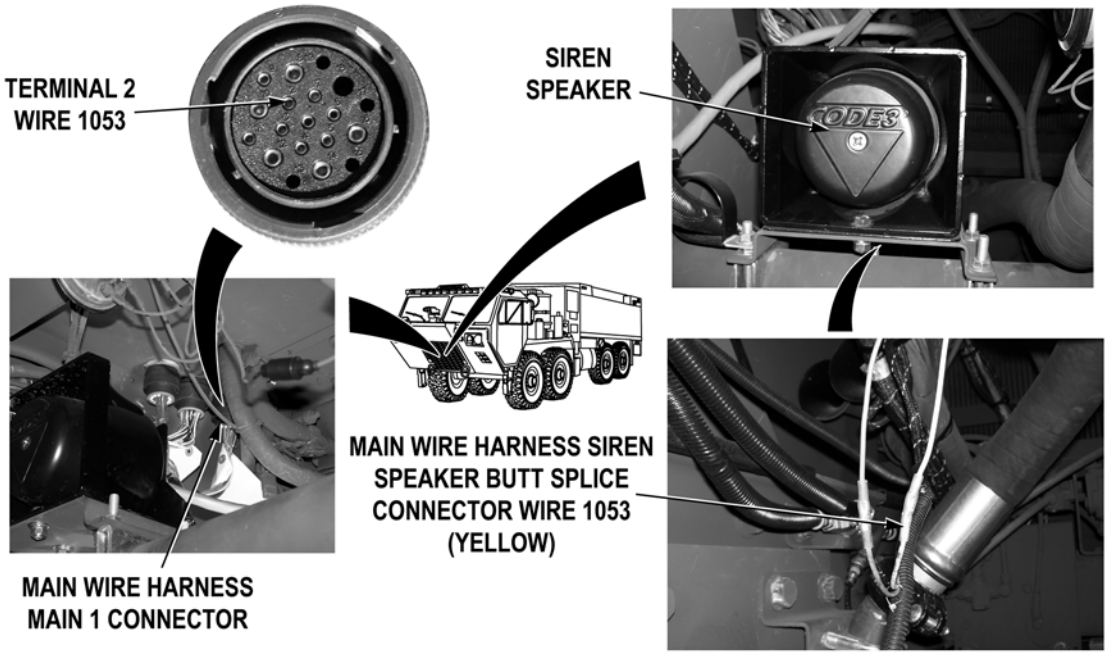
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 13. Cut main wire harness siren speaker butt splice connector wire 1053 (yellow) at siren speaker. With a test lead set, check for continuity across wire 1053 (yellow) from main wire harness siren speaker butt splice connector, termination to cab power distribution wire harness siren control MP2 connector, terminal C.

If there is continuity, replace siren speaker (WP 0272).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

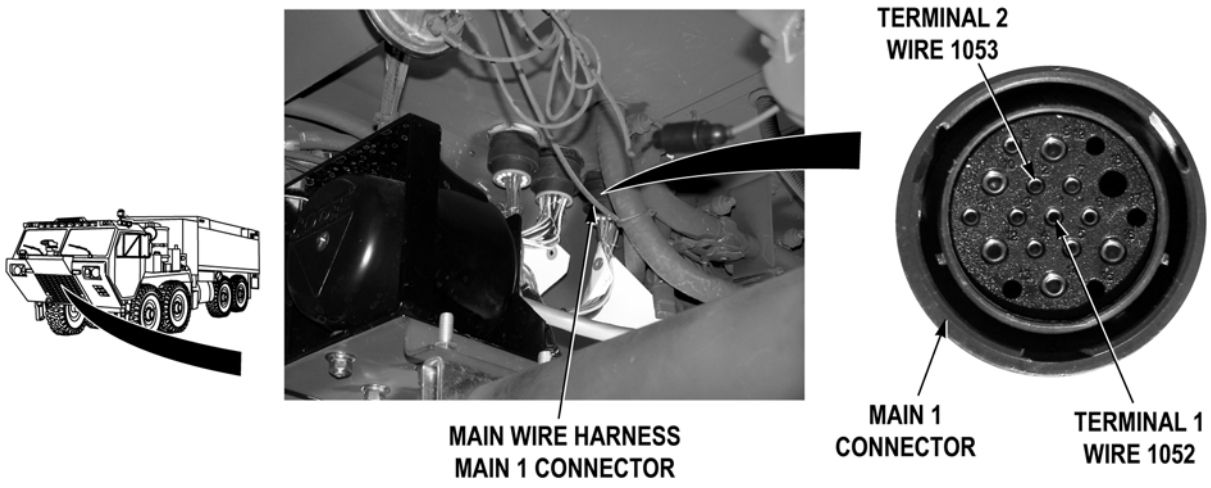


Step 14. Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across wire 1053 (yellow), from main wire harness main 1 connector, terminal 2 to main wire harness siren speaker butt splice connector, termination.

a. If there is continuity, repair wire 1053 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1053 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



NOTE

Steps 15 and 16 check main wire harness wires 1052 (brown) and 1053 (orange) for a short to ground.

Step 15. If battery disconnect switch is in on position, pull battery disconnect switch to off position (WP 0007). If EMERG MASTER switch is in on position, put EMERG MASTER switch to off position (WP 0007). With a test lead set, check for continuity (short to ground) of main wire harness wire 1052 (brown) from main wire harness main 1 connector, terminal 1 to a known good ground.

If there is continuity, repair wire 1052 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

Step 16. With a test lead set, check for continuity (short to ground) of main wire harness wire 1053 (orange) from main wire harness main 1 connector, terminal 2 to a known good ground.

a. If there is continuity, repair wire 1053 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness (WP 0280).

b. If there is no continuity, replace siren control (WP 0381).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

SHORELINE INLET RECEPTACLE DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

References
TM 9-2320-315-14&P
WP 0008
WP 0113
WP 0267
WP 0341

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

SHORELINE INLET RECEPTACLE DOES NOT OPERATE PROPERLY

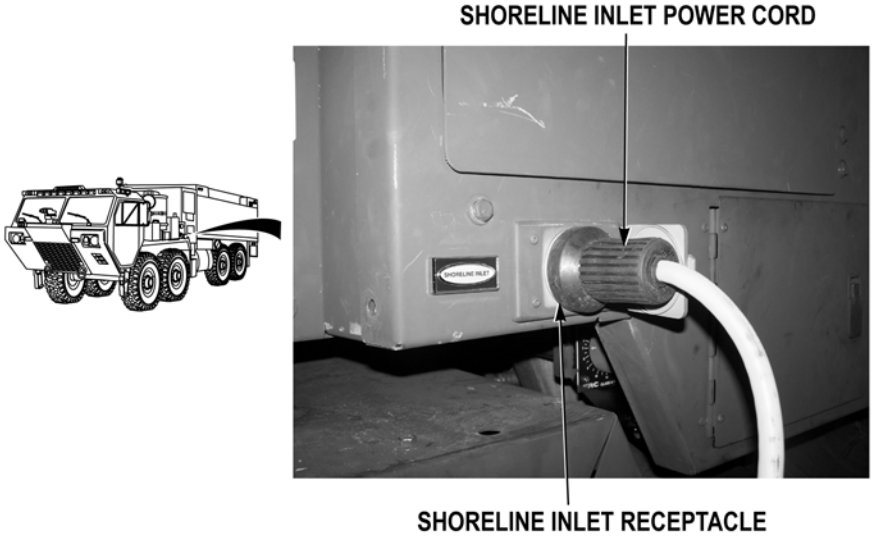
WARNING

- **110 Volt AC power is potentially lethal. Do not work on AC wiring when it is connected to a power source. Failure to comply may cause injury or death to personnel.**
- **SHORELINE INLET receptacle discharges shoreline inlet power cord from receptacle with force. Ensure that area near vehicle is free of flammable liquids, combustible materials, or liquids that can conduct electricity. Shoreline inlet power cord is powered with 110 VAC when discharged from SHORELINE INLET receptacle. Failure to comply may result in injury or death to personnel or damage to equipment.**

NOTE

Periodically inspect shoreline inlet power cord rubber connector protector. Rubber connector protector covers shoreline inlet power cord female plug with 1/8" rubber to protect connector and nearby obstructions from impact damage.

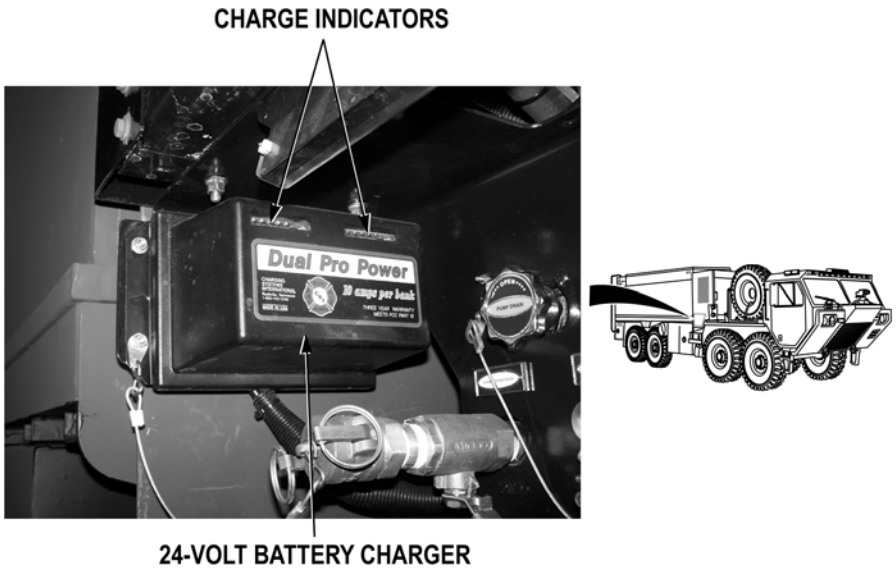
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 1. Connect shoreline inlet power cord to SHORELINE INLET receptacle. Turn ENGINE switch to START position (TM 9-2320-279-10). Check if shoreline inlet power cord is discharged from SHORELINE INLET receptacle.

If shoreline inlet power cord does not fully discharge from SHORELINE INLET receptacle, go to Step 3.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

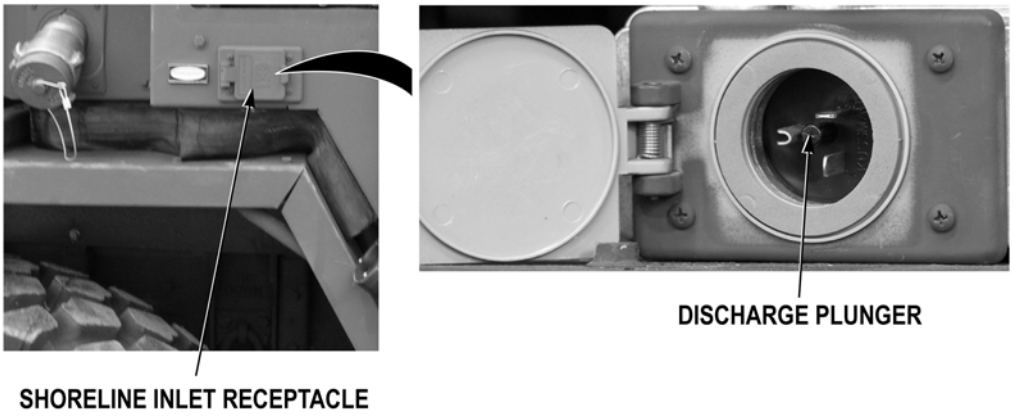


Step 2. Connect shoreline inlet power cord to SHORELINE INLET receptacle and power source. Open passenger side pump house panel controls access door (WP 0008). Check if 24-volt battery charger, charge indicators are illuminated.

a. If 24-volt battery charger charge indicators do not illuminate, troubleshoot 24-Volt Battery Charger Does Not Operate Properly (WP 0113).

b. If 24-volt battery charger charge indicators are illuminated, fault corrected.

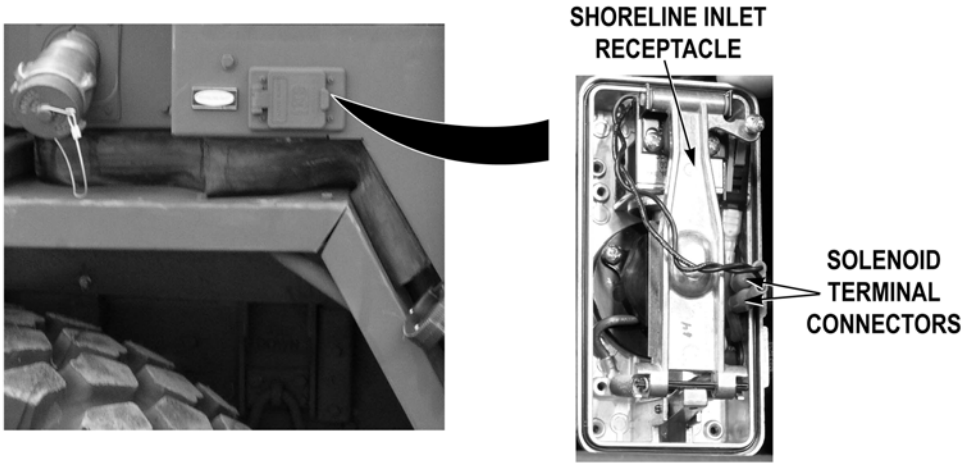
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 3. Disconnect shoreline inlet power cord from SHORELINE INLET receptacle and power source. Open SHORELINE INLET receptacle protective cover. Inspect SHORELINE INLET receptacle plastic discharge plunger for damage.

If SHORELINE INLET receptacle plunger is damaged, replace SHORELINE INLET receptacle (WP 0267).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 4. Remove SHORELINE INLET receptacle from pump house panel A (WP 0341). Remove four screws from SHORELINE INLET receptacle. Remove back plate from SHORELINE INLET receptacle. Disconnect SHORELINE INLET receptacle 24 VDC solenoid connectors. While an assistant puts ENGINE switch to START position (TM 9-2320-279-10), check for 22 to 28 VDC between SHORELINE INLET receptacle solenoid from terminal connector to terminal connector while engine is being cranked.

a. If 22 to 28 VDC are present, replace SHORELINE INLET receptacle (WP 0267).

b. If 22 to 28 VDC are not present, repair wires from SHORELINE INLET receptacle to HEMTT starter if repairable (TM 9-2320-315-14&P), or replace SHORELINE INLET receptacle (WP 0267).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PUMP HOUSE HEATER DOES NOT OPERATE PROPERLY

INITIAL SETUP:

Tools and Special Tools
Lead Set, Test (WP 0399, Item 14)
Tool Kit, General Mechanic's: Automotive (WP 0399, Item 17)

Personnel Required
MOS 63B Wheeled Vehicle Mechanic (2)

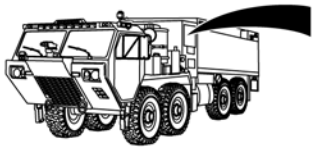
References
TM 9-2320-315-14&P
WP 0004
WP 0007
WP 0009
WP 0203
WP 0240
WP 0242
WP 0261

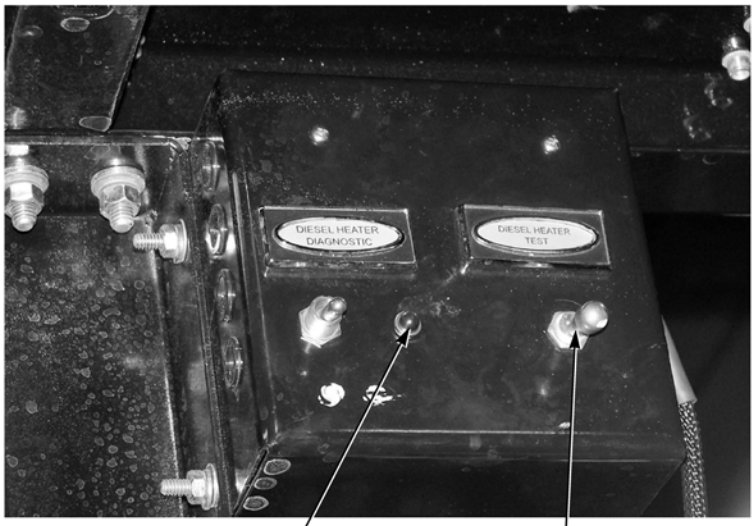
References (continued)
WP 0280
WP 0293
WP 0300
WP 0303
WP 0308
WP 0309
WP 0310
WP 0312
WP 0341

Equipment Conditions
Engine OFF (TM 9-2320-279-10)
Wheels chocked (TM 9-2320-279-10)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
PUMP HOUSE HEATER DOES NOT OPERATE PROPERLY		

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION





WARNING

- **CARBON MONOXIDE (EXHAUST GAS) CAN CAUSE DEATH**
- **Carbon monoxide gas is generated whenever pump house heater is operating. Do not operate pump house heater in an enclosed area without proper ventilation. Failure to comply may cause injury or death to personnel.**

Step 1. Push battery disconnect switch to on position (WP 0007). Open pump house access door assembly (WP 0009). Put DIESEL HEATER TEST switch to on position (WP 0004). Check if pump house heater operates.

If pump house heater operates, go to Step 3.

Step 2. With DIESEL HEATER TEST switch in on position (WP 0004), check if pump house heater attempts to start, does not attempt to start, or starts and shuts down.

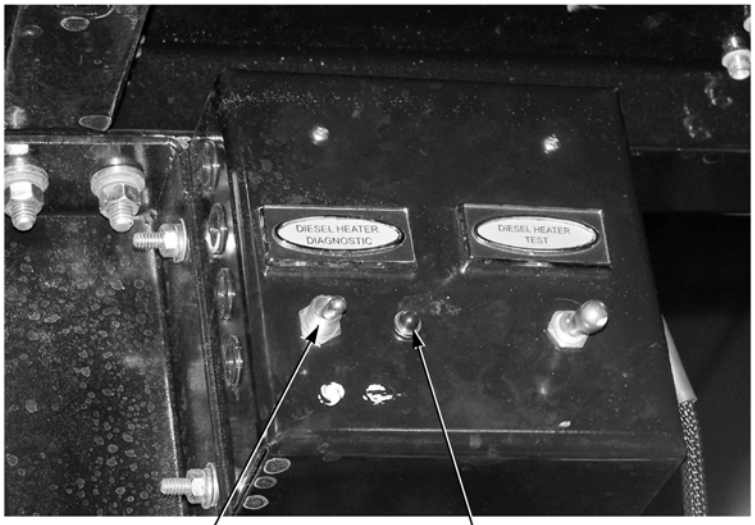
a. If pump house heater attempts to start or starts and shuts down, go to Step 7.

b. If pump house heater does not attempt to start, go to Step 20.

Step 3. Check if DIESEL HEATER DIAGNOSTIC indicator illuminates (WP 0004).

If DIESEL HEATER DIAGNOSTIC indicator does not illuminate, go to Step 16.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 4. Put DIESEL HEATER DIAGNOSTIC switch in up position (WP 0004). Check if DIESEL HEATER DIAGNOSTIC indicator flashes.

If DIESEL HEATER DIAGNOSTIC indicator flashes, go to Step 9.

WARNING

- **CARBON MONOXIDE (EXHAUST GAS) CAN CAUSE DEATH**
- **Carbon monoxide gas is generated whenever pump house heater is operating. Do not operate pump house heater in an enclosed area without proper ventilation. Failure to comply may cause injury or death to personnel.**

Step 5. Release DIESEL HEATER DIAGNOSTIC switch (WP 0004). Operate pump house heater for 10 minutes. Check if heater shuts down.

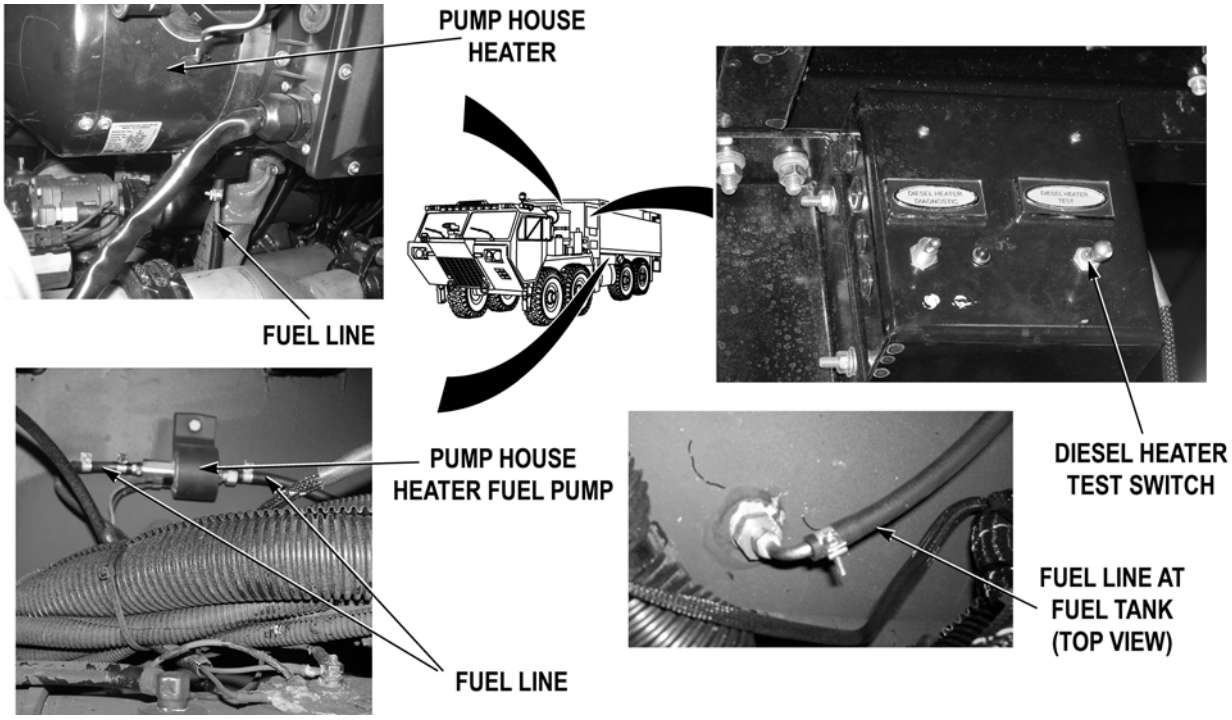
If heater shuts down, go to Step 9.

Step 6. Put DIESEL HEATER DIAGNOSTIC switch in up position (WP 0004). Check if DIESEL HEATER DIAGNOSTIC indicator flashes.

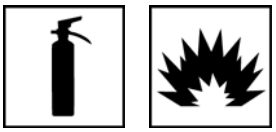
a. If DIESEL HEATER DIAGNOSTIC indicator flashes, go to Step 9.

b. If DIESEL HEATER DIAGNOSTIC indicator does not flash, replace pump house heater diagnostic module thermostatic switch (WP 0309).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING



Fuel is very flammable and can explode easily. Keep fuel away from open fire and keep fire extinguisher within easy reach when working with fuel. When working with fuel, post signs that read NO SMOKING WITHIN 50 FEET of vehicle. Failure to comply may cause injury to death to personnel.

NOTE

Pump house heater fuel pump will make an audible clicking sound when operating.

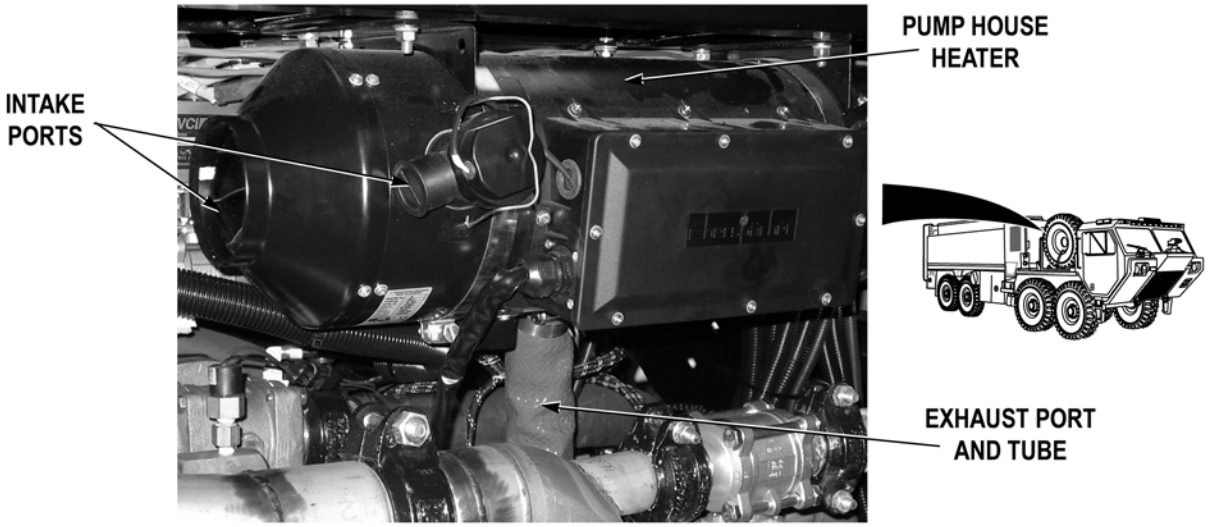
Step 7. Put DIESEL HEATER TEST switch to off position (WP 0004). While an assistant puts DIESEL HEATER TEST switch to on position, check if pump house heater fuel pump operates.

If pump house heater fuel pump does not operate, go to Step 10.

Step 8. Put DIESEL HEATER TEST switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel G (WP 0341). Check fuel line from pump house heater to fuel tank for leaks, kinks and damage.

If fuel line is leaking, kinked, or damaged, replace fuel line (WP 0310).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

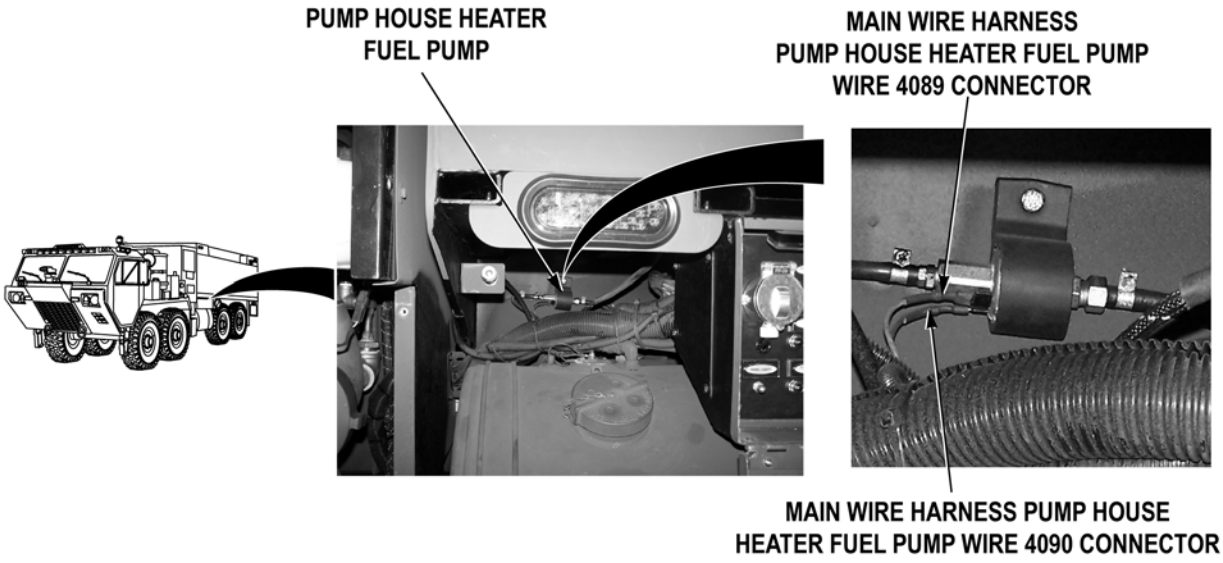
Diesel heater exhaust tube becomes very hot during operation. Do not touch or allow body to come in contact with exhaust tube when hot. Allow sufficient time for diesel heater exhaust tube to cool before performing any maintenance to system. Failure to comply may cause injury or death to personnel.

Step 9. If on, put DIESEL HEATER TEST switch to off position (WP 0004). If on, pull battery disconnect switch to off position (WP 0007). Remove pump house panel E (WP 0341). After system cools, check pump house heater intake and exhaust ports for blockage.

a. If pump house heater intake or exhaust ports are blocked, remove blockage.

b. If pump house heater intake and exhaust ports are not blocked, replace pump house heater (WP 0312).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



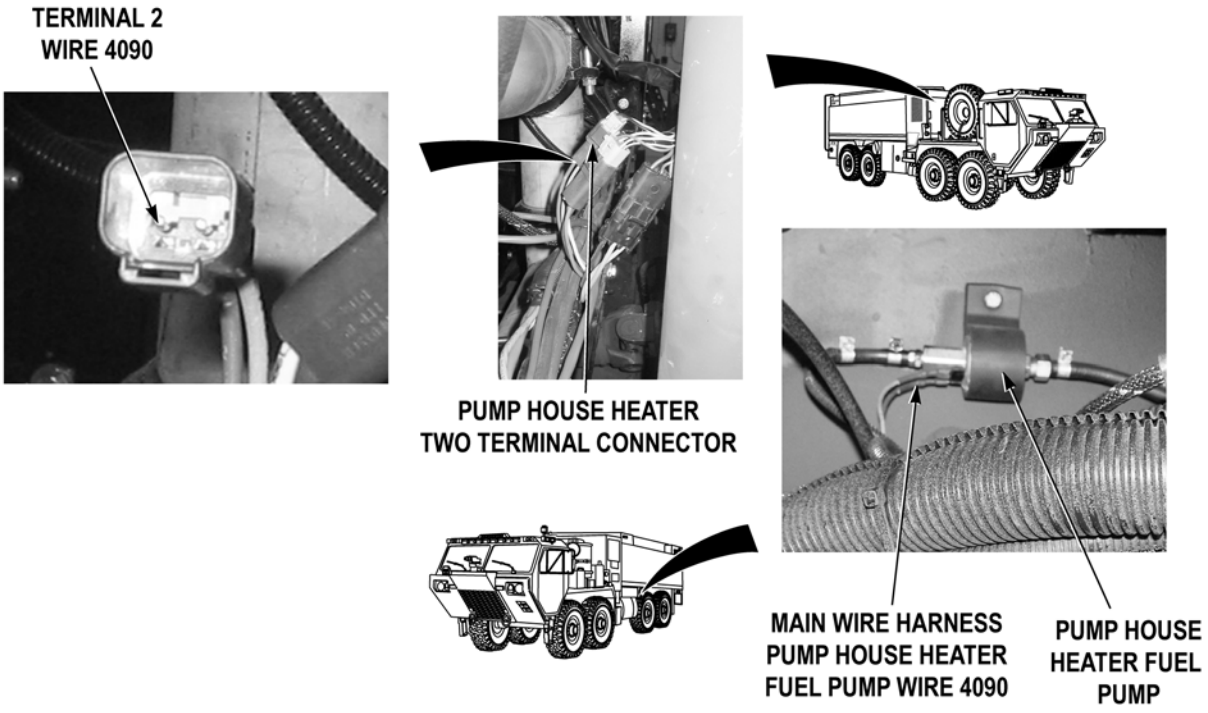
Step 10. Put DIESEL HEATER TEST switch to off position (WP 0004). Disconnect main wire harness pump house heater fuel pump wire 4089 (green) from pump house heater fuel pump connector. Put DIESEL HEATER TEST switch to on position (WP 0004). Check for 22 to 28 VDC between main wire harness pump house heater fuel pump wire 4089 (green), terminal and a known good ground.

If 22 to 28 VDC are not present, go to Step 14.

Step 11. Pull battery disconnect switch to off position (WP 0007). Disconnect main wire harness pump house heater fuel pump wire 4090 (purple) from pump house heater fuel pump connector. Check for continuity across wire 4090 (purple) from main wire harness pump house heater fuel pump, terminal and a known good ground.

If there is continuity, replace pump house heater fuel pump (WP 0310).

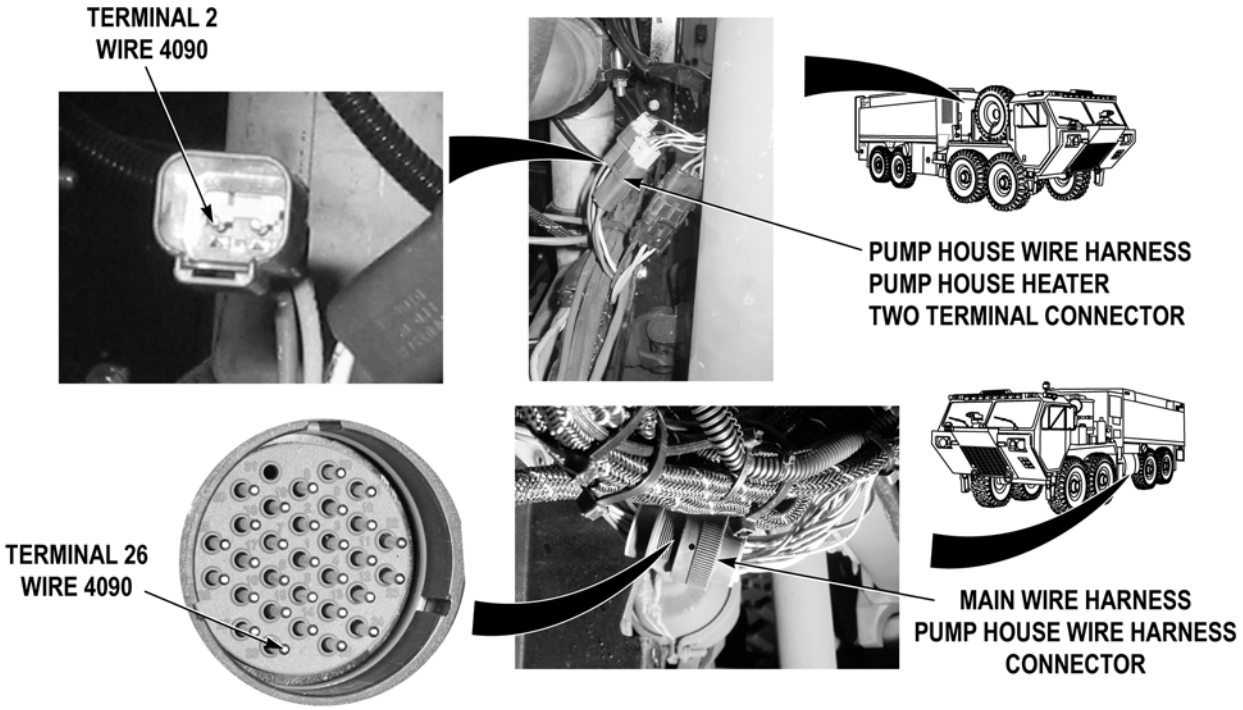
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 12. Remove pump house panel G (WP 0341). Disconnect pump house wire harness pump house heater two terminal connector. With a test lead set, check for continuity across wire 4090 (purple) from pump house wire harness pump house heater two terminal connector, terminal 2 to main wire harness pump house heater fuel pump, terminal.

If there is continuity, replace pump house heater (WP 0312).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

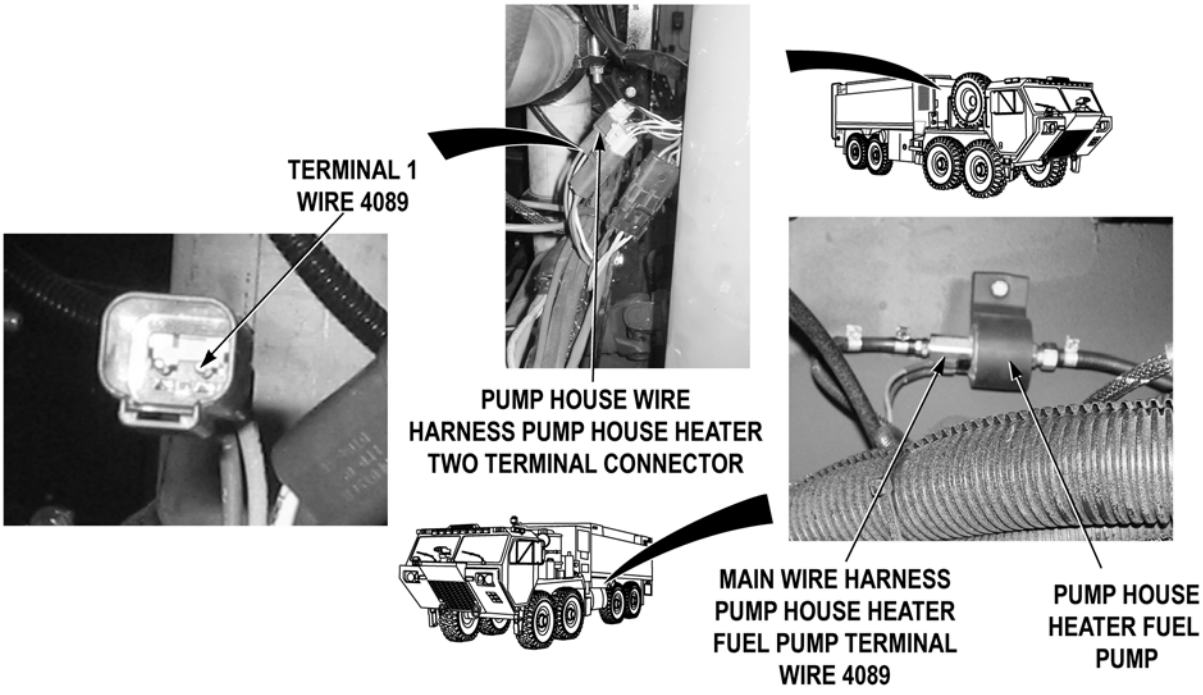


Step 13. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 4090 (purple) from main wire harness pump house wire harness connector, terminal 26 to pump house wire harness pump house heater two terminal connector, terminal 2.

a. If there is continuity, repair wire 4090 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 4090 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

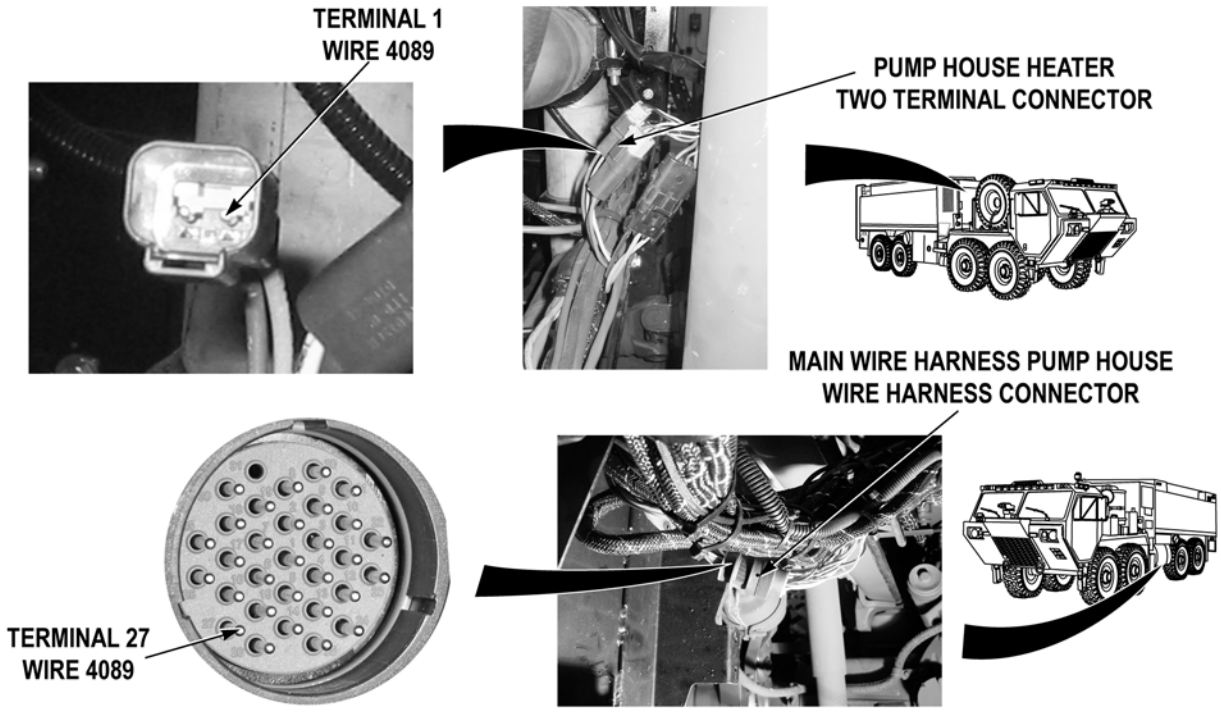
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 14. Pull battery disconnect switch to off position (WP 0007). Remove pump house panel G (WP 0341). Disconnect pump house wire harness pump house heater two terminal connector. With a test lead set, check for continuity across wire 4089 (green) from pump house wire harness pump house heater two terminal connector, terminal 1 to main wire harness pump house heater fuel pump, terminal.

If there is continuity, replace pump house heater (WP 0312).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

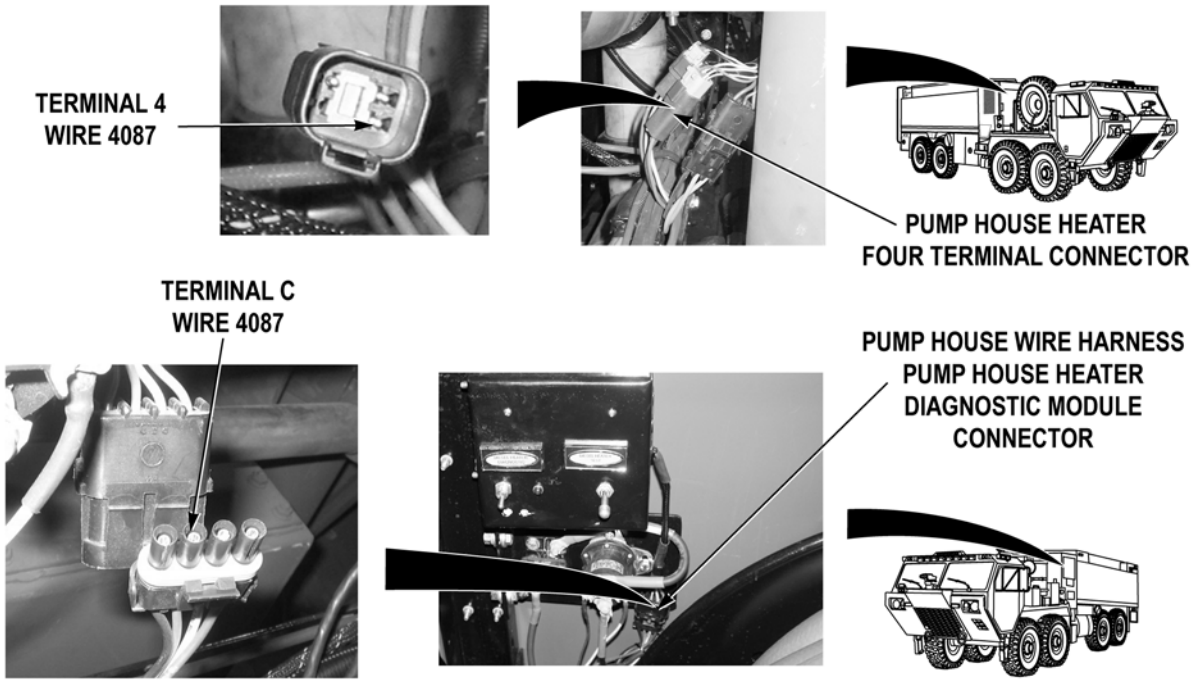


Step 15. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 4089 (green) from main wire harness pump house wire harness connector, terminal 27 to pump house wire harness pump house heater two terminal connector, terminal 1.

a. If there is continuity, repair wire 4089 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 4089 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

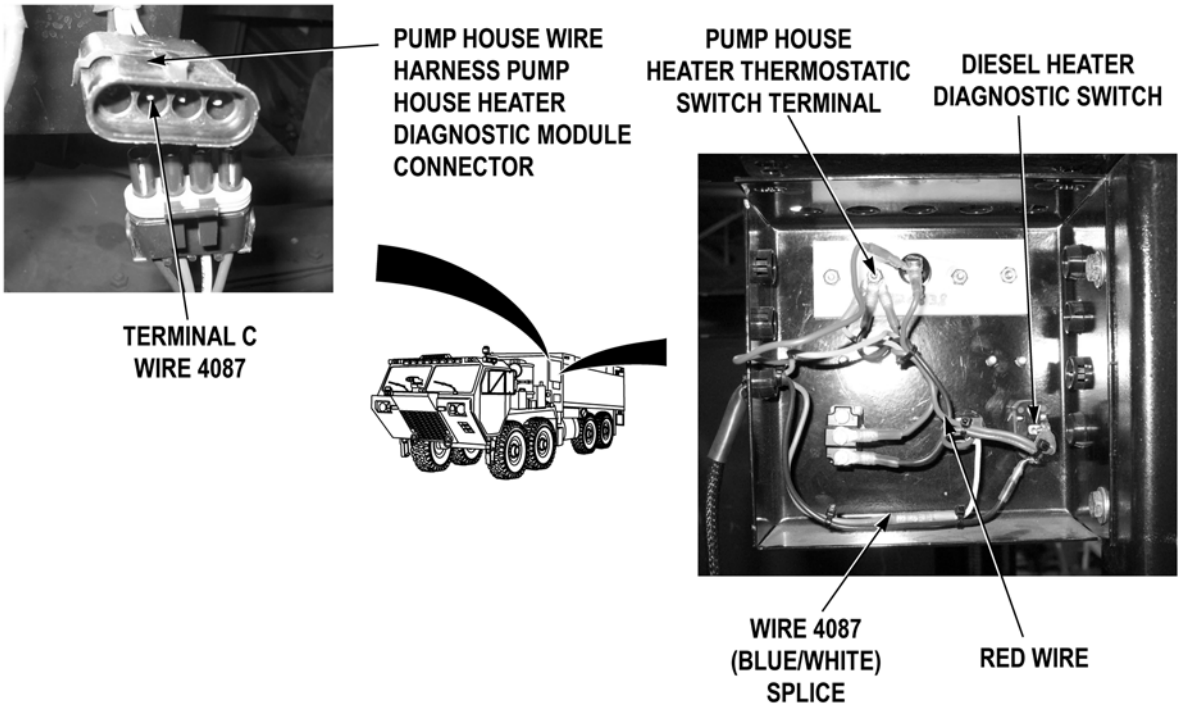
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 16. Put DIESEL HEATER TEST switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Open pump house access door assembly (WP 0009). Disconnect pump house wire harness pump house heater diagnostic module connector. Remove pump house panel G (WP 0341). Disconnect pump house wire harness pump house heater four terminal connector. With a test lead set, check for continuity across pump house wire harness wire 4087 (blue) from pump house heater diagnostic module connector, terminal C to pump house heater four terminal connector, terminal 4.

If there is no continuity, repair wire 4087 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



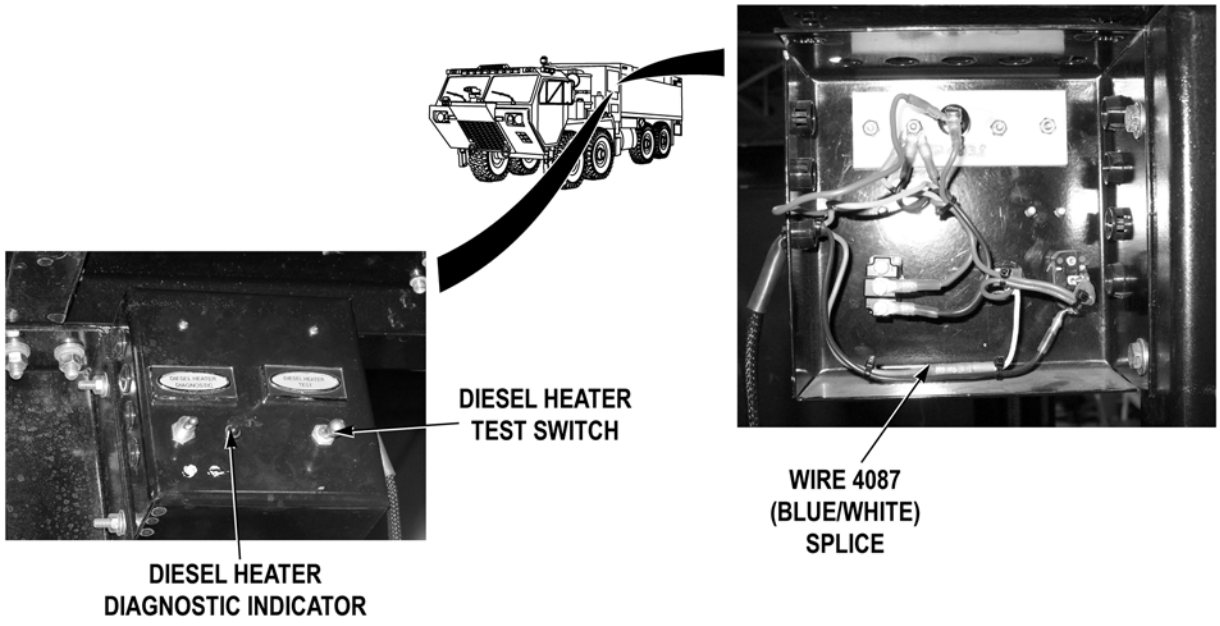
Step 17. Remove pump house panel E (WP 0341). Check for continuity across red wire from pump house heater thermostatic switch to DIESEL HEATER DIAGNOSTIC switch.

If there is no continuity, repair red wire if repairable (TM 9-2320-315-14&P), or replace pump house heater diagnostic module (WP 0309).

Step 18. Cut pump house heater diagnostic module wire 4087 (blue and white) at butt splice connector. Check for continuity across wire 4087 (blue) from pump house wire harness pump house heater diagnostic module connector, terminal C to pump house heater diagnostic module butt splice connector termination.

If there is no continuity, repair wire 4087 if repairable (TM 9-2320-315-14&P), or replace pump house heater diagnostic module (WP 0309).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

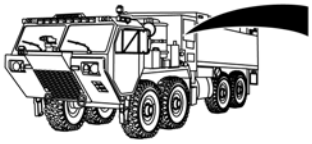
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

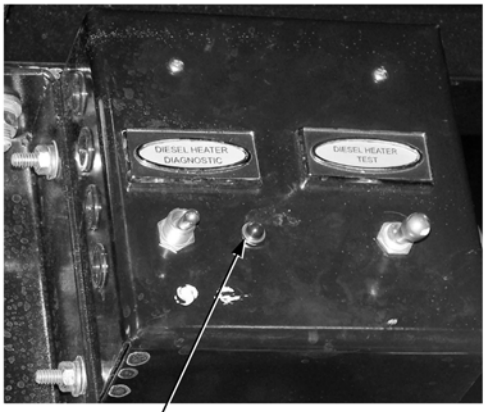
Step 19. Connect test set lead between white wire which was cut in Step 18 and a known good ground. Connect pump house wire harness pump house heater diagnostic module connector. Connect main wire harness pump house heater four terminal connector. Push battery disconnect switch to on position (WP 0007). Put DIESEL HEATER TEST switch to on position (WP 0004). Check if DIESEL HEATER DIAGNOSTIC indicator illuminates (WP 0004).

a. If DIESEL HEATER DIAGNOSTIC indicator illuminates, repair pump house diagnostic module wire 4087 (blue and white) (TM 9-2320-315-14&P), and replace pump house heater (WP 0312).

b. If DIESEL HEATER DIAGNOSTIC indicator does not illuminate, replace pump house heater diagnostic module (diagnostic indicator) (WP 0309).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

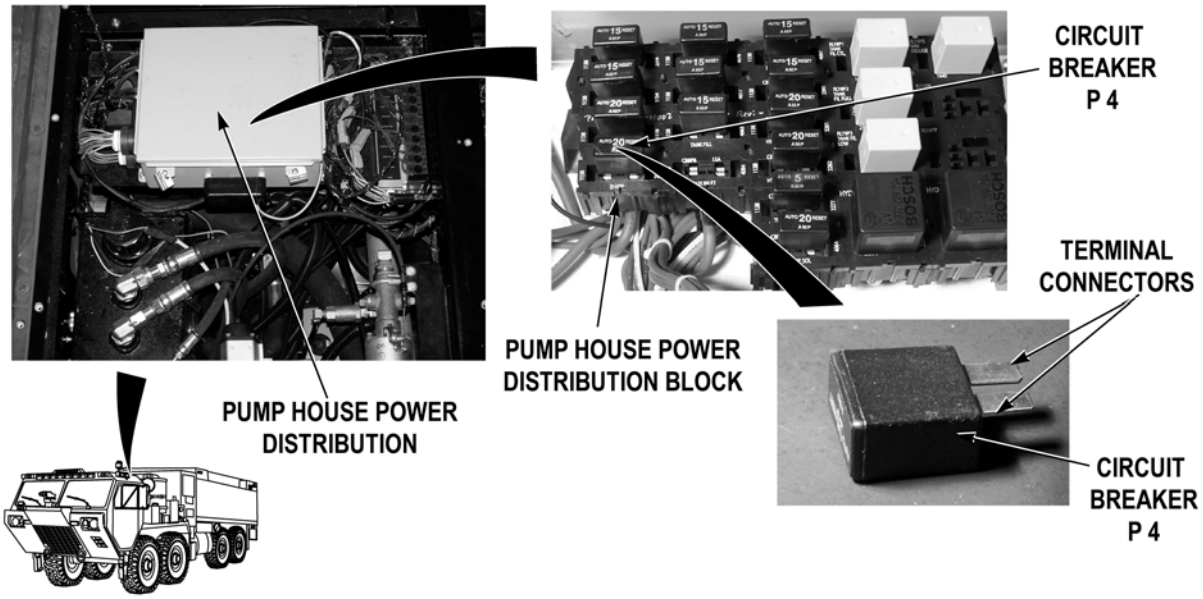




Step 20. Check if DIESEL HEATER DIAGNOSTIC indicator illuminates (WP 0004).

If DIESEL HEATER DIAGNOSTIC indicator does not illuminate, go to Step 26.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



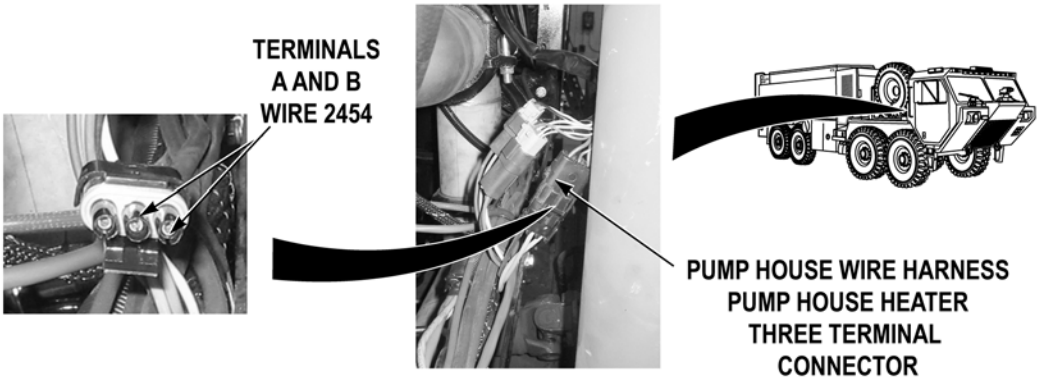
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 21. Put DIESEL HEATER TEST switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Remove pump house panel K (WP 0341). Open pump house power distribution box (WP 0261). Remove circuit breaker P 4 (WP 0261). Check for continuity across circuit breaker P 4.

If there is no continuity, replace circuit breaker P 4 (WP 0261).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



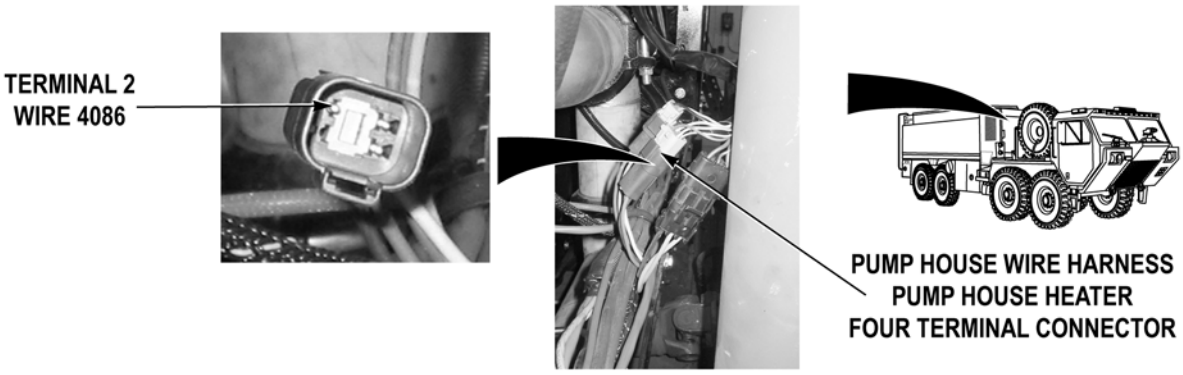
Step 22. Install circuit breaker P 4 (WP 0261). Remove pump house panel G (WP 0341). Disconnect pump house wire harness pump house heater three terminal connector. Push battery disconnect switch to on position (WP 0007). Check for 22 to 28 VDC between wires 2454 (green) at pump house wire harness pump house heater three terminal connector, terminals A and B, and a known good ground.

a. If 22 to 28 VDC are not present at both terminals, go to Step 25.

b. If 22 to 28 VDC are present at one but not both terminals, repair wire 2454 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

c. If 22 to 28 VDC are present at both terminals, go to Step 23.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



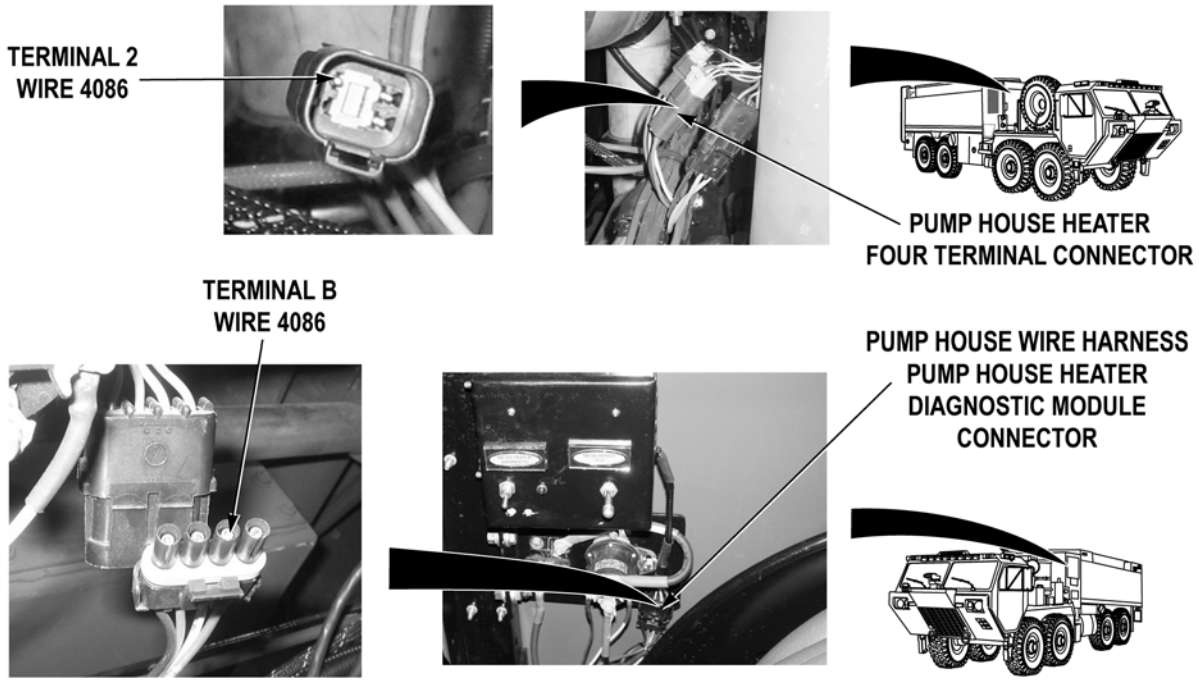
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 23. Disconnect pump house wire harness pump house heater four terminal connector. Put DIESEL HEATER TEST switch to on position (WP 0004). With a test lead set, check for 22 to 28 VDC between pump house wire harness wire 4086 (yellow) at pump house wire harness pump house heater four terminal connector, terminal 2 and a known good ground.

If 22 to 28 VDC are present, replace pump house heater (WP 0312).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

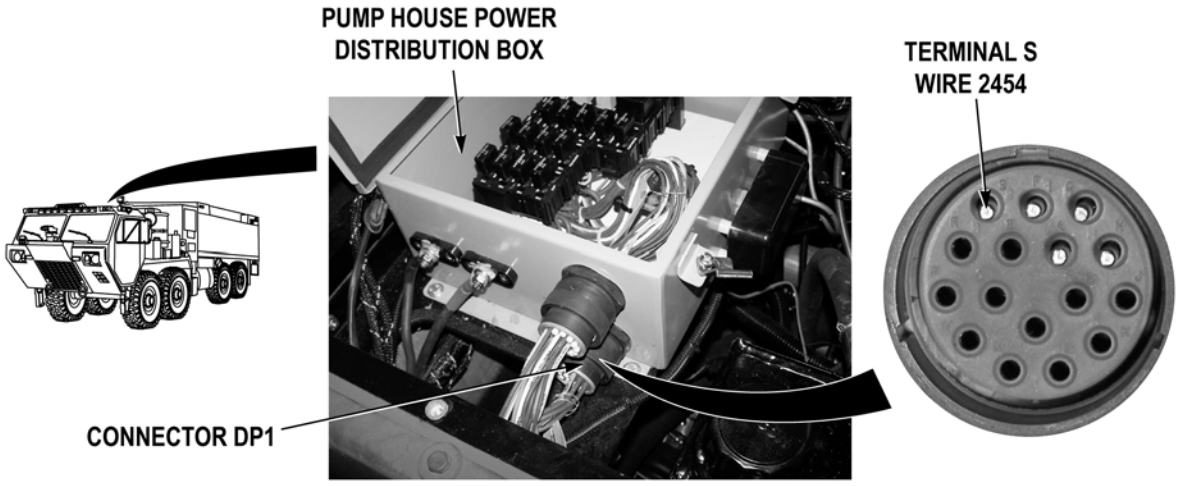


Step 24. Put DIESEL HEATER TEST switch to off position (WP 0004). Pull battery disconnect switch to off position (WP 0007). Disconnect pump house wire harness pump house heater diagnostic module connector. With a test lead set, check for continuity across pump house wire harness wire 4086 (yellow) from pump house heater diagnostic module connector, terminal B to pump house heater four terminal connector, terminal 2.

a. If there is continuity, repair wire 4068 in pump house heater diagnostic module wire harness if repairable (TM 9-2320-315-14&P), or replace pump house heater diagnostic module wire harness (WP 0309).

b. If there is no continuity, repair wire 4068 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

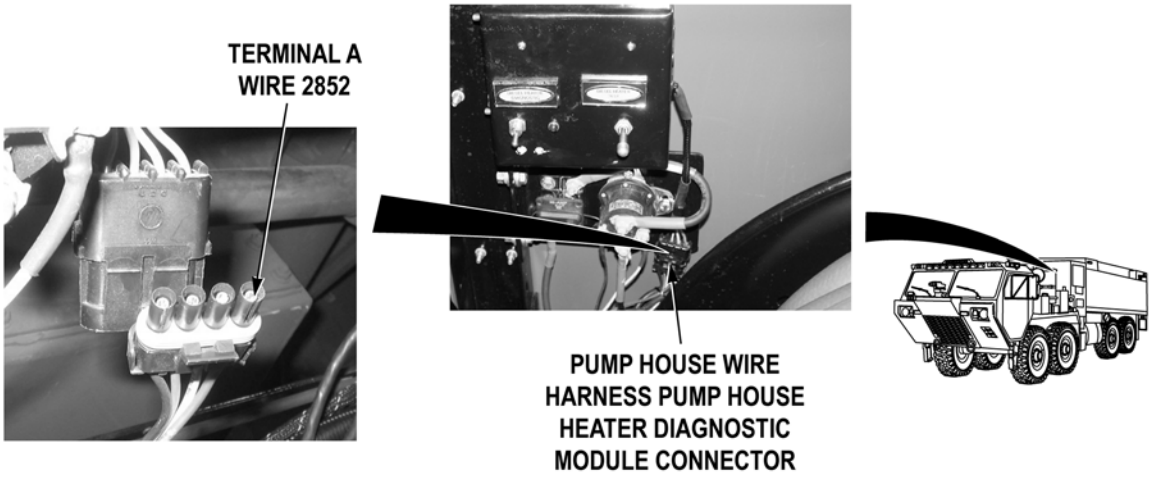
Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 25. Disconnect pump house wire harness pump house power distribution connector DP1. With a test lead set, check for 22 to 28 VDC between wire 2454 (green) at pump house power distribution wire harness connector DP1, terminal S and a known good ground.

a. If 22 to 28 VDC are not present, repair wire 2454 in pump house power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace pump house power distribution wire harness and block (WP 0300).

b. If 22 to 28 VDC are present, repair wire 2454 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



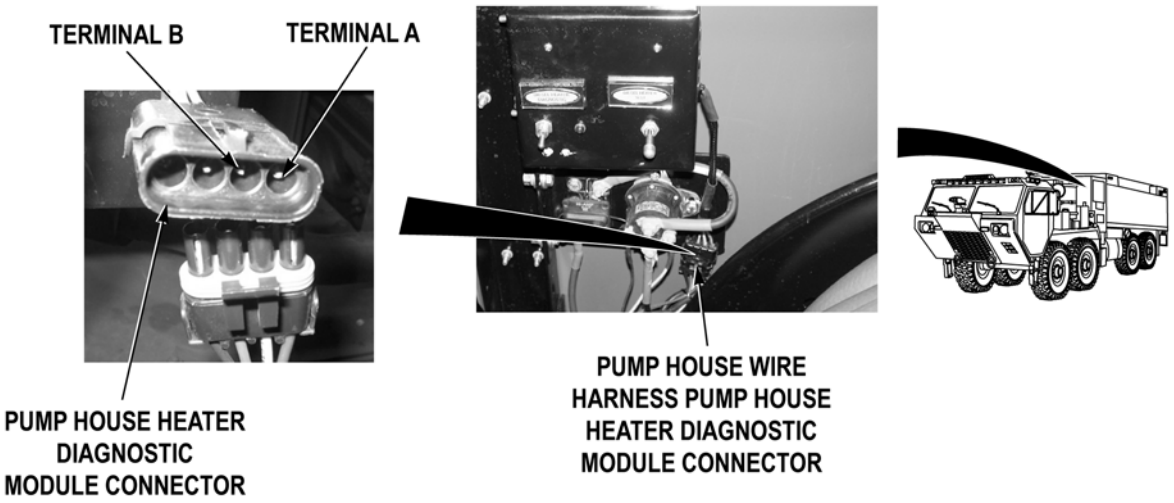
WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 26. Disconnect pump house wire harness pump house heater diagnostic module connector. With a test lead set, check for 22 to 28 VDC between wire 2852 (red) at pump house wire harness pump house heater diagnostic module connector, terminal A and a known good ground.

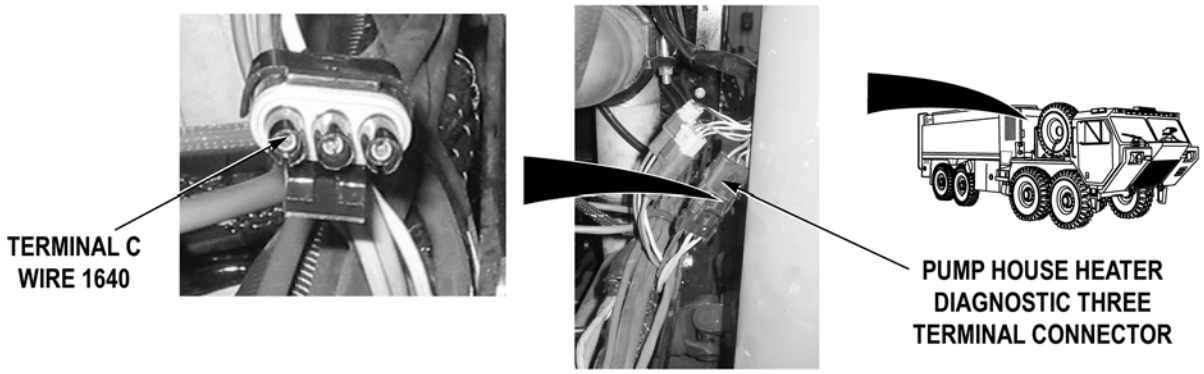
If 22 to 28 VDC are not present, go to Step 32.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 27. Pull battery disconnect switch to off position (WP 0007). With a test lead set, check for continuity across pump house heater diagnostic module connector, terminals A and B when DIESEL HEATER TEST switch is in on position (WP 0004).

If there is no continuity, go to Step 29.

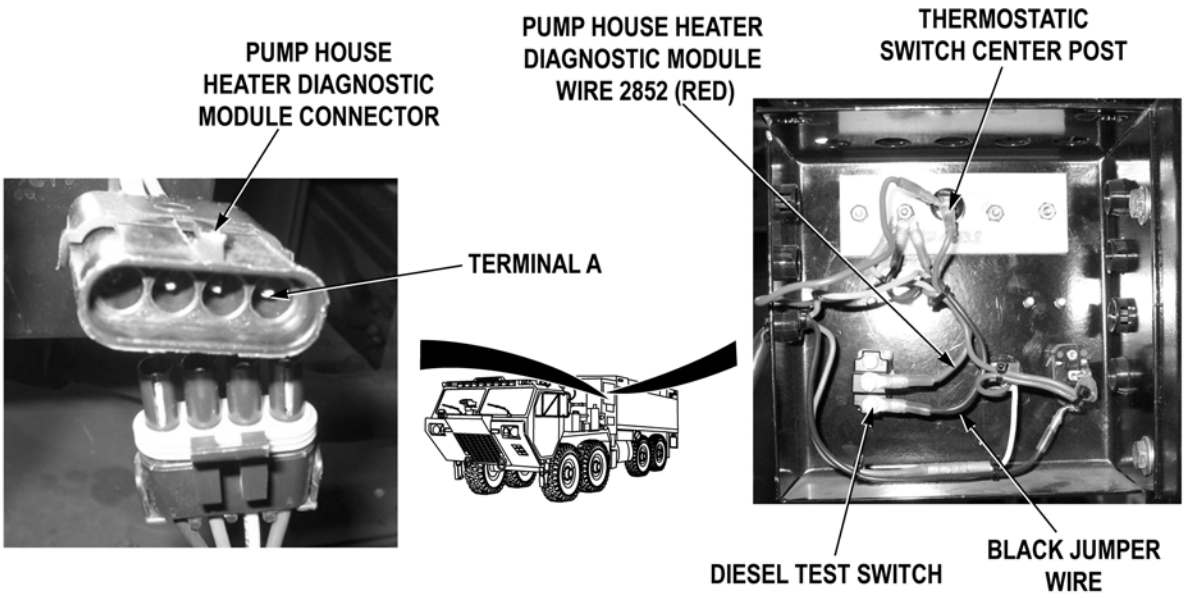


Step 28. Remove pump house panel G (WP 0341). Disconnect pump house wire harness pump house heater three terminal connector. With a test lead set, check for continuity across wire 1640 (black) from pump house wire harness pump house heater three terminal connector, terminal C to a known good ground.

a. If there is continuity, replace pump house heater (WP 0312).

b. If there is no continuity, repair wire 1640 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 29. Check for continuity across pump house heater diagnostic module wire 2852 (red) from pump house diagnostic module connector, terminal A to thermostatic switch center post (red wire) terminal.

If there is no continuity, repair wire 2852 if repairable (TM 9-2320-315-14&P), or replace pump house heater diagnostic module (WP 0309).

Step 30. Check for continuity across pump house heater diagnostic module DIESEL HEATER TEST switch when in on position (WP 0004).

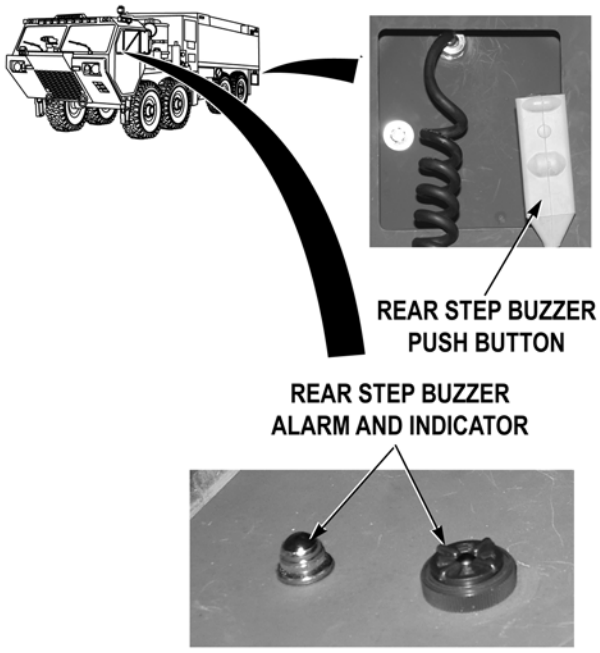
If there is no continuity, replace pump house heater diagnostic module DIESEL HEATER TEST switch (WP 0308).

Step 31. Check for continuity across pump house heater diagnostic module wire 2852 (red) from thermostatic switch center post (red wire) terminal to DIESEL HEATER TEST switch.

a. If there is continuity, repair black jumperwire between DIESEL HEATER TEST switch and thermostatic switch if repairable (TM 9-2320-315-14&P), or replace pump house heater diagnostic module (WP 0309).

b. If there is no continuity, repair wire 2852 if repairable (TM 9-2320-315-14&P), or replace pump house heater diagnostic module (WP 0309).

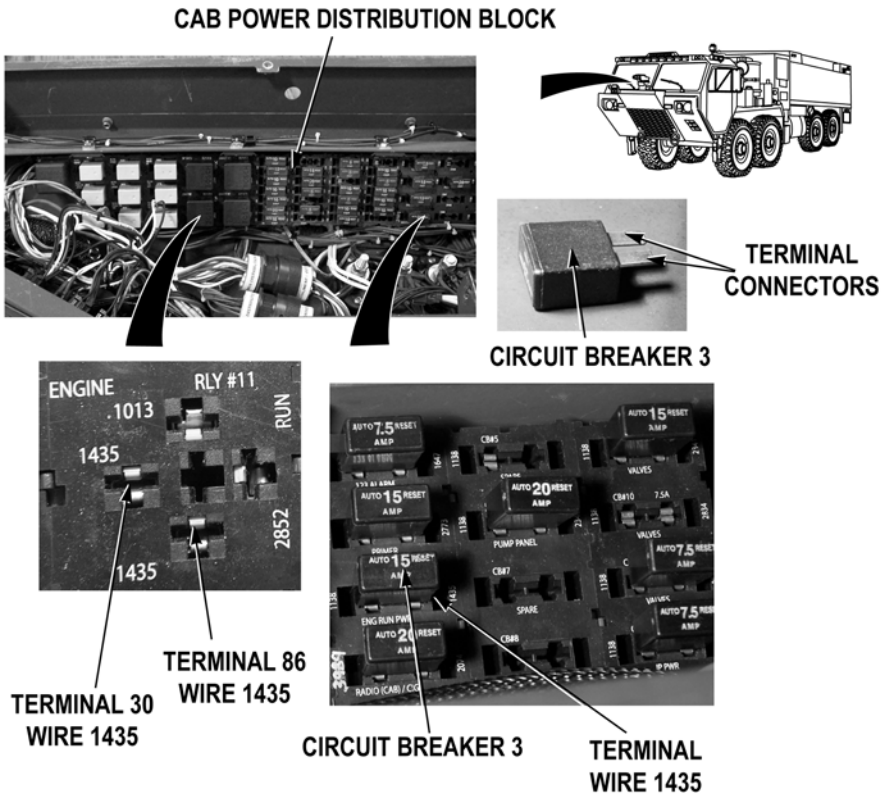
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 32. While an assistant pushes rear step buzzer push button (WP 0004). Check if rear buzzer alarm and indicator operates.

If rear step buzzer indicator and alarm do not operate, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



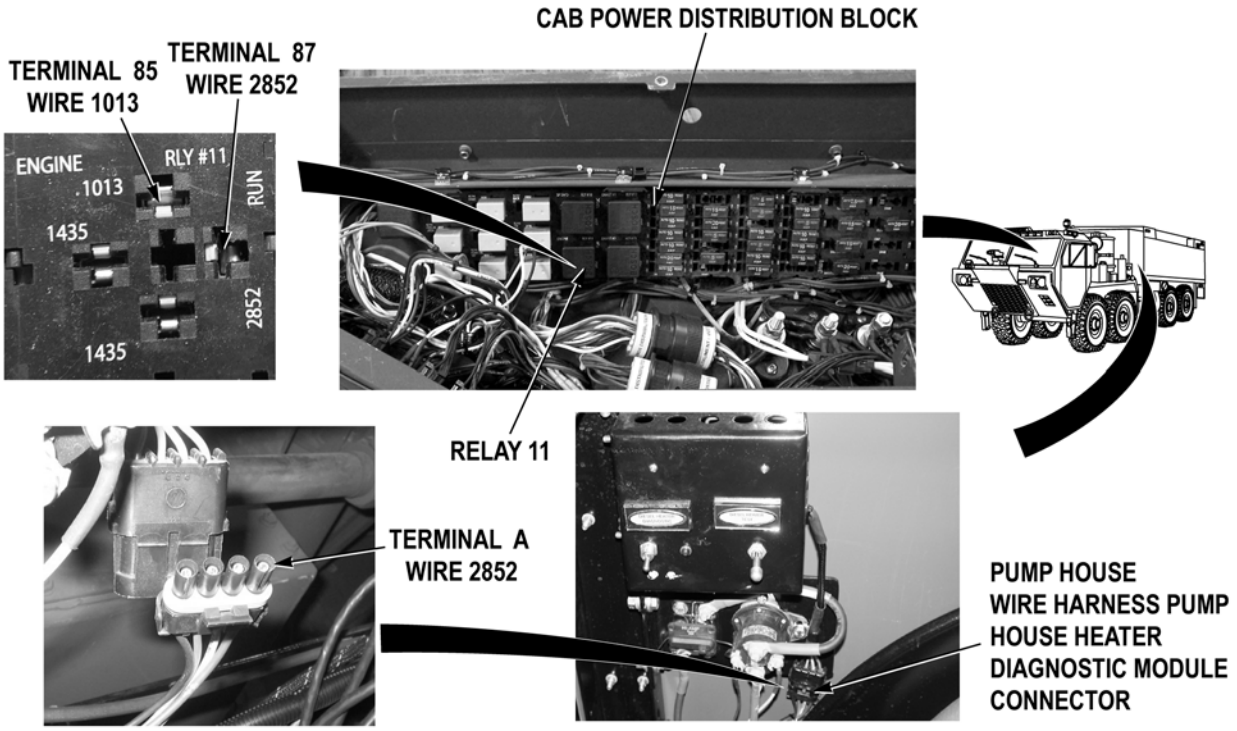
Step 33. Pull battery disconnect switch to off position (WP 0007). Remove cab instrument panel A (WP 0203). Remove circuit breaker 3 (WP 0240). Check for continuity across circuit breaker 3.

If there is no continuity, replace circuit breaker 3 (WP 0240).

Step 34. Remove relay 11 (WP 0242). Check for continuity across wire 1435 (violet) from circuit breaker 3 connector, terminal to relay 11 connector, terminals 30 and 86.

If there is no continuity between either terminal, replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



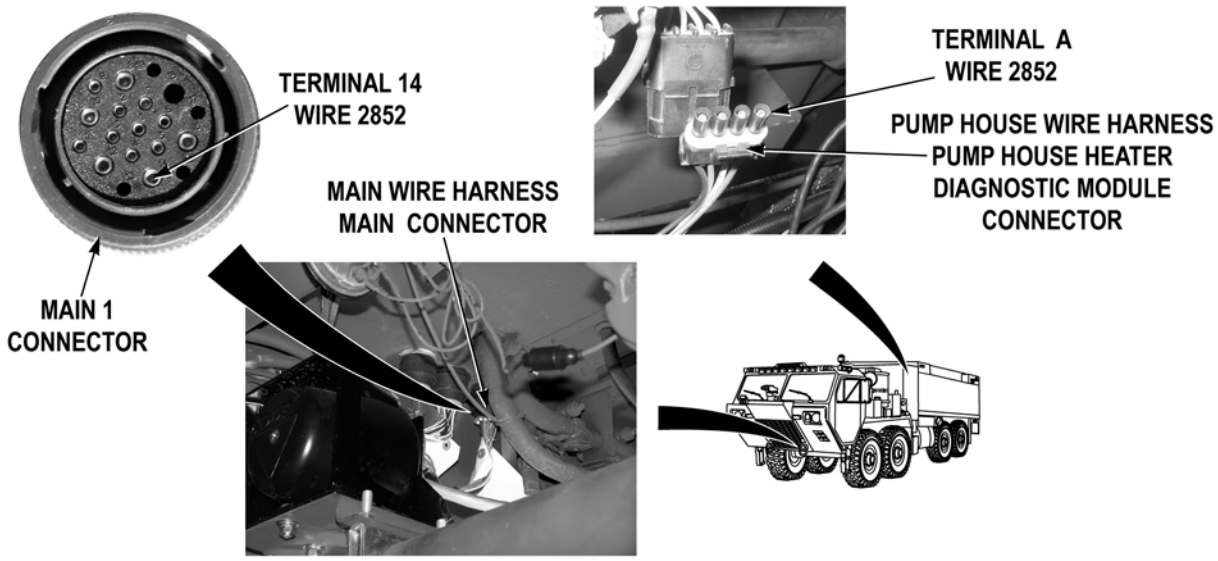
Step 35. Install circuit breaker 3 (WP 0240). Check for continuity across wire 1013 (brown) from relay 11 connector, terminal 85 to a known good ground.

If there is no continuity, go to Step 39.

Step 36. Check for continuity across wire 2852 (red) from relay 11 connector, terminal 87 to pump house wire harness pump house heater diagnostic module connector, terminal A.

If there is continuity, replace relay 11 (WP 0242).

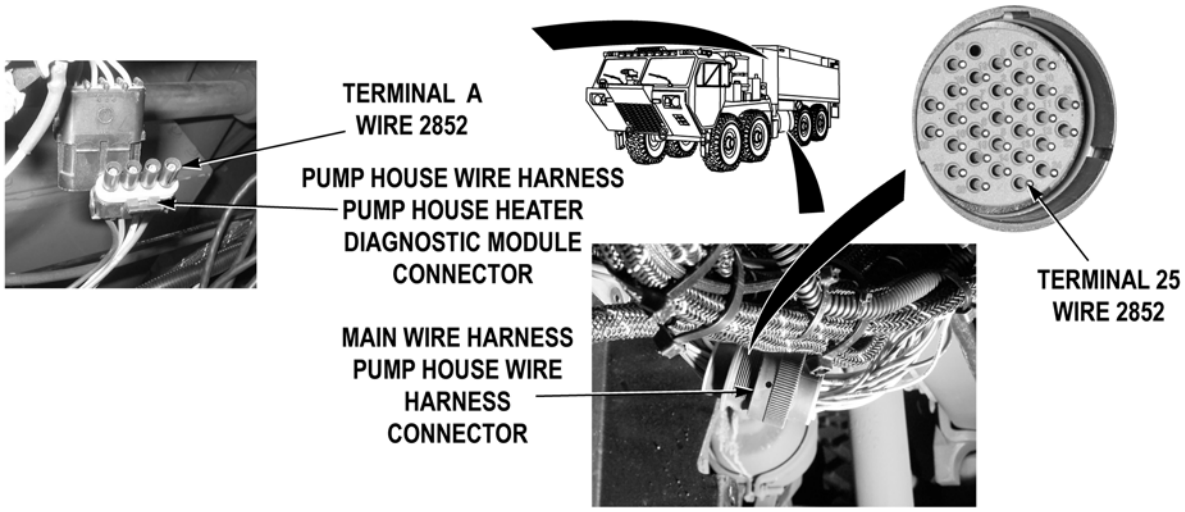
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



Step 37. Remove skid plate grille (WP 0350). Disconnect main wire harness main 1 connector. With a lead test set, check for continuity across wire 2852 (red) from main wire harness main 1 connector, terminal 14 to pump house heater diagnostic module connector, terminal A.

If there is continuity, repair wire 2852 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

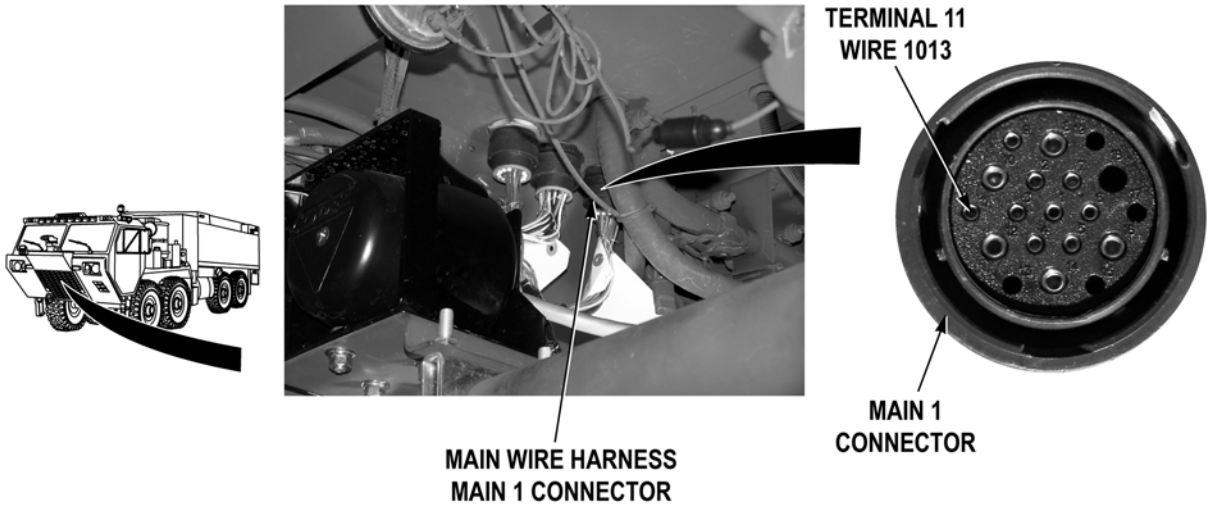


Step 38. Disconnect main wire harness pump house wire harness connector. With a test lead set, check for continuity across pump house wire harness wire 2852 (red) from main wire harness pump house wire harness connector, terminal 25 to pump house wire harness pump house heater diagnostic module connector, terminal A.

a. If there is continuity, repair wire 2852 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

b. If there is no continuity, repair wire 2852 in pump house wire harness if repairable (TM 9-2320-315-14&P), or replace pump house wire harness (WP 0303).

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION



WARNING

Remove rings, wristwatches, neck chains, and any other jewelry before working around vehicle. Jewelry can catch on equipment and cause serious injury. Jewelry and tools may short across electrical circuits and cause damage to equipment, or severe burns or electrical shock to personnel.

Step 39. Disconnect main wire harness main 1 connector. With a test lead set, check for continuity across main wire harness wire 1013 (brown) from main 1 connector, terminal 11 to a known good ground.

a. If there is continuity, repair wire 1013 in cab power distribution wire harness if repairable (TM 9-2320-315-14&P), or replace cab power distribution wire harness and block (WP 0280).

b. If there is no continuity, repair wire 1013 in main wire harness if repairable (TM 9-2320-315-14&P), or replace main wire harness (WP 0293).

END OF TASK

FOLLOW-ON MAINTENANCE

Remove wheel chocks (TM 9-2320-279-10)

END OF TASK

END OF WORK PACKAGE

CHAPTER 4

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

FIELD LEVEL MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

INTRODUCTION

Preventive Maintenance Checks and Services (PMCS) are required inspections and care of your vehicle is necessary to keep it in proper working order. All instructions are mandatory. This section contains PMCS requirements for the HEWATT installed enhancements to the basic HEMTT vehicle. The PMCS table (WP 0126) contains checks and services necessary to ensure enhancements are ready for operation. Using the PMCS table, perform preventive maintenance checks and services at the specified intervals.

WARNING

Solvent cleaning compound MIL-PRF-680 Type II and III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion can cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage. Can be fatal if swallowed. Inhalation of high/massive concentrations can cause coma or be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. Failure to follow this warning may result in injury or death to personnel.

- **The flashpoint for Type II solvent cleaning compound is 141-198°F (61-92°C) and Type III is 200-241°F (93-116ºC).**
- **Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.**
- **Fire extinguishers should be placed nearby when using solvent cleaning compound. Failure to follow this warning may result in injury or death.**
- **Cloths or rags saturated with solvent cleaning compound must be disposed of IAW authorized facilities' procedures. Failure to follow this warning may result in injury.**
- **Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.**

a. Cleanliness.

Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Use solvent cleaning compound on metal surfaces and soapy water on rubber.

b. Bolts, Nuts, and Screws.

Check bolts, nuts, and screws for obvious looseness, missing, bent, or broken condition and tighten or replace as necessary. If they cannot be checked with a tool, look for chipped paint, bare metal, or rust around bolt heads.

c. Welds.

Look for loose or chipped paint, rust, or gaps where parts are welded together. If a cracked weld is found, notify the supervisor.

d. Electrical Wires and Connectors.

Look for cracked or broken insulation, exposed wires, and loose or broken connectors. Tighten loose connectors and ensure that wires are in good shape.

e. Fluid Hoses, Tubes, and Fittings.

Look for wear, damage, or leaks. Ensure clamps and fittings are tight. Wet spots show leaks, but a stain around a fitting or connector may also indicate a leak. If connector or fitting is loose, tighten it. If hoses, tubes, or fittings are broken or worn out, repair or replace per applicable procedure.

f. Air System Components.

Look for worn, damaged, or leaking components. Ensure clamps and fittings are tight. If a leak comes from a loose fitting or connector, tighten it. If component is damaged or worn out, repair or replace per applicable procedure.

g. Damage.

Damage is defined as any condition that affects safety or would make the truck unserviceable for mission requirements.

PMCS WARNINGS AND CAUTIONS

Always observe the warnings and cautions appearing in your PMCS table. Warnings and cautions appear before applicable procedures. You must observe these warnings and cautions to prevent serious injury to yourself or prevent equipment being damaged.

EXPLANATION OF TABLE ENTRIES

If an item or component being inspected is inoperable or damaged, either troubleshoot by following instructions in troubleshooting section of this manual or repair and/or replace as described in related maintenance task.

When doing preventive maintenance, take along tools and supplies needed to make all checks, including a clean cloth or two.

The following is a breakdown of the PMCS table:

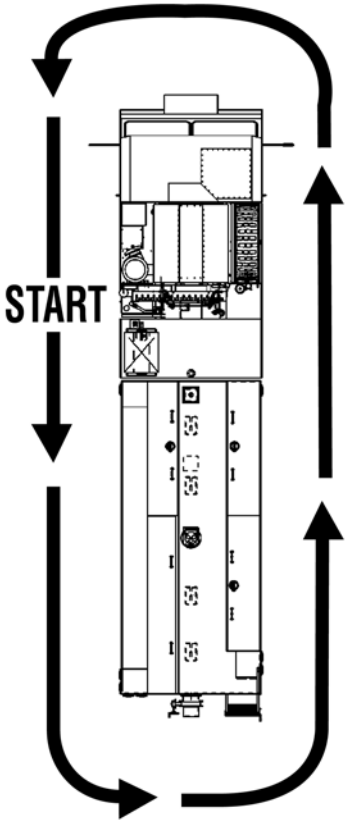
1. **Item No. Column.** Checks and services are numbered in a logical order for moving around the vehicle.
2. **Interval Column.** This column identifies when the PMCS should be performed.
   (a) Perform (A-After Operations) checks right after operating vehicle.
   (b) Perform (D-During Operations) checks during operation of vehicle.
   (c) Perform (W-Weekly) checks weekly.
   (d) Perform (M-Monthly) checks monthly.
3. **Item To Be Inspected Procedure Column.** This column identifies item to be inspected and contains all information required to do check/inspection. A digital photo is supplied to aid user in identifying items. Whenever replacement is recommended, reference is made to applicable maintenance instructions.
4. **Not Mission Capable If Column.** This column contains a brief statement of condition that would cause vehicle to be less than fully ready to perform its assigned mission.

ROUTING DIAGRAM

WARNING

Engine must be shut off and parking brake set before performing PMCS walk around. Severe injury to personnel may result.

Refer to Preventive Maintenance Checks and Services (PMCS) for HEWATT vehicle. This routing diagram will be of help to complete the PMCS. It shows vehicle PMCS routing track that matches the sequence of PMCS to be performed.



LEAKAGE CLASSIFICATION AND DEFINITION

Extreme weather conditions, periods of high use, or combat conditions may dictate that PMCS is performed more often than is required in the PMCS Table.

As PMCS is performed, look for and be aware of an unusual amount of puddles, or unusually large puddles. Excessive puddles could indicate a leakage problem.

It is necessary to know how fluid leakage affects status of fuel, oil, coolant, and hydraulic system. The following are definitions of the type/classes of leakage necessary to know in order to determine status of the enhancement. Learn, then be familiar with them and REMEMBER - WHEN IN DOUBT, NOTIFY THE SUPERVISOR.

CAUTION

Equipment operation is allowable with minor leakage (Class I or II). Consideration must be given to the capacity in item/system being checked/inspected. When in doubt, notify Supervisor. When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS. Class III leaks should be repaired per applicable procedure.

1. **Class I.** Seepage of fluid, as indicated by wetness or discoloration, not great enough to form drops.
2. **Class II.** Leakage of fluid great enough to form drops, but not enough to cause drops that fall from item being checked/inspected.
3. **Class III.** Leakage of fluid great enough to form drops that fall from item being checked/inspected.

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

- These checks are to be performed in the order listed, within designated interval.
- Perform basic HEMTT PMCS (TM 9-2320-279-10) prior to performing PMCS in this table.
- Battery switch must be in the ON position to perform PMCS checks (TM 9-2320-279-10).
- While performing PMCS, be aware of any unusual puddles under the vehicle; this could indicate a leakage problem.
- Perform Weekly if:
    - Assigned as the operator but have not operated vehicle since last weekly inspection.
    - Operating the vehicle for the first time.

Table 1. Preventive Maintenance Checks and Services.

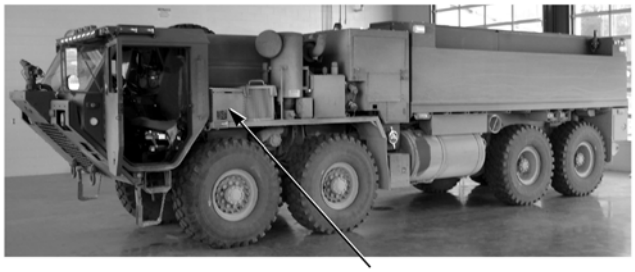
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
MAKE THE FOLLOWING WALK AROUND CHECKS:				
			WARNING **Chock wheels prior to performing any After Operation, Weekly, or Monthly PMCS procedures.**	
			 	
1	A	Driver Side Body	a. Inspect SINCGARS access door and enclosure for damage and loose or missing hardware. b. Inspect SINCGARS for damage and/or loose connections.	If SINCGARS is damaged or non-operational.

Table 1. Preventive Maintenance Checks and Services. (Continued)

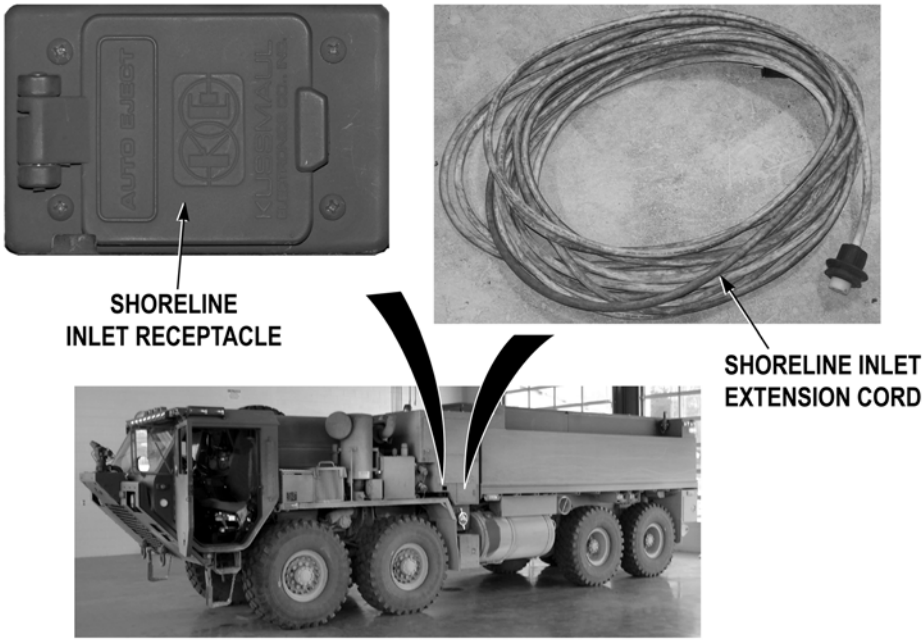
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
2	A	Driver Side Pump House		
			a. Check if pump house access panels are free from damage and loose or missing hardware. b. Check if shoreline inlet receptacle operates and is free from damage and loose or missing hardware. c. Check shoreline inlet extension cord and seals for damage or excessive wear.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

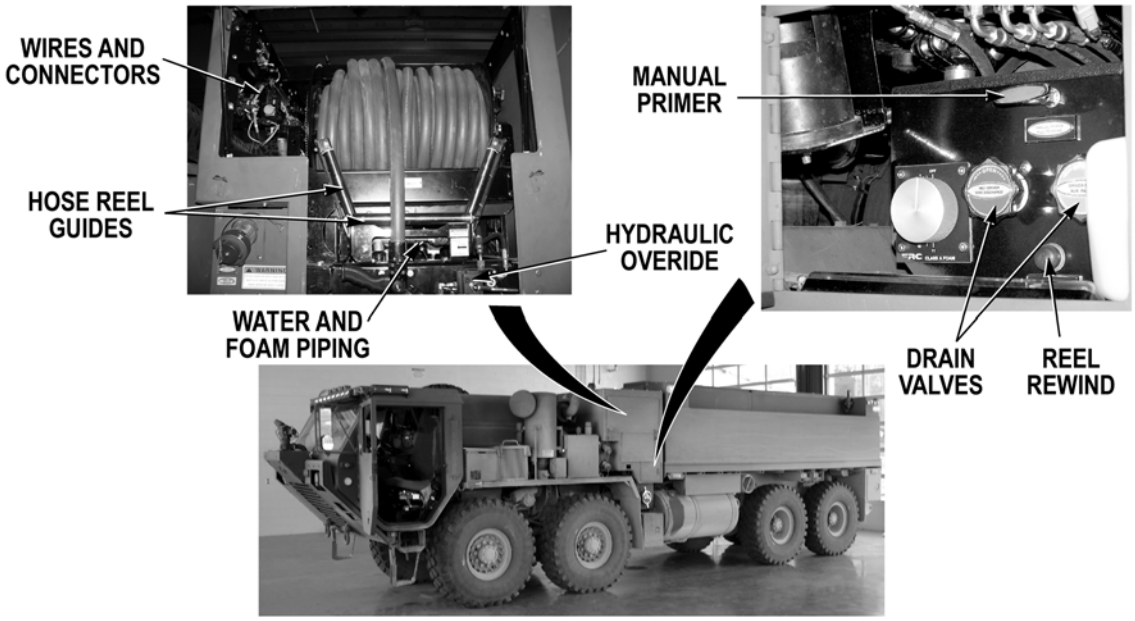
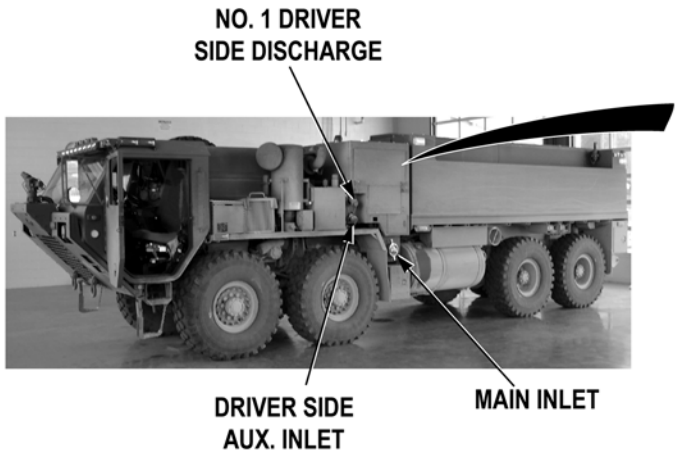
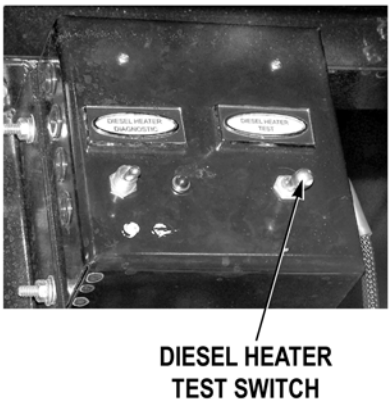
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
				
			d. Examine hose reel, hose, and hose reel guide assembly for damage and loose or missing hardware. (Lubricate if required, see Table 2).	
			e. Examine hose reel nozzle for damage and obstructions.	
			f. Check if REEL REWIND button, MANUAL PRIMER handle, and hydraulic override controls operate and are free from damage (WP 0004).	
			g. Check if NO. 1 DRIVER SIDE DISCHARGE and DRIVER SIDE AUX. INLET drain valves operate and are free from damage.	
			h. Check if water piping, foam piping, hydraulic hoses, and air hoses are free from leaks, kinks, damage and loose or missing fittings.	If water piping, foam piping, hydraulic hoses are damaged or have loose or missing hardware.
			i. Check if wires are free from damage and loose connections.	If wires are damaged.

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:





			j. Check if main inlet, NO. 1 DRIVER SIDE DISCHARGE, and DRIVER SIDE AUX. INLET caps operate properly and are free from damage. k. Check if main inlet screen is present and free from damage. l. Operate diesel heater test switch. Check if heater operates (WP 0004).	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
3	A	Driver Side Body		

STOWAGE COMPARTMENT D2

WARNING

- **Items in compartments may have shifted or come loose during operations. Use caution and be aware that items may fall out while opening doors, causing injury to personnel.**
- **While parked on side slopes, items inside compartments may fall out. Use caution and be aware that items may fall out while opening doors causing injury to personnel.**

			a. Check if stowage compartment door D2 operates and is free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.) b. Inventory and inspect all COEI and BII items that have been used in mission for damage, missing gaskets, and proper operation (WP 0039). c. Inspect COEI and BII mountings for damage and loose or missing hardware. d. If fording operations were required, inspect D2 stowage compartment for dirt, debris, and foreign materials. Clean stowage compartment D2, COEI, and BII if required.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

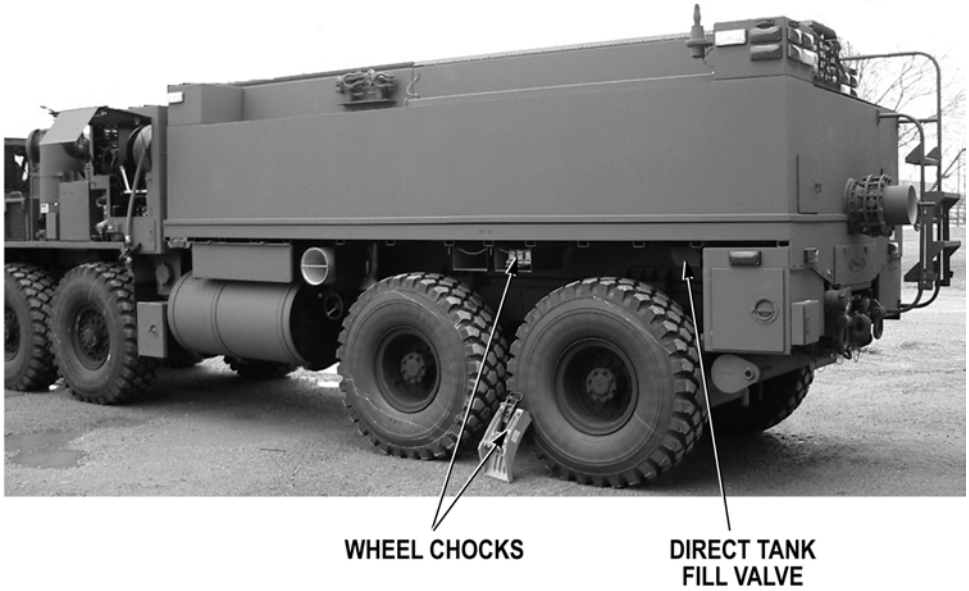
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
			 **WARNING** • **Items in compartments may have shifted or come loose during operations. Use caution and be aware that items may fall out while opening doors, causing injury to personnel.** • **While parked on side slopes, items inside compartments may fall out. Use caution and be aware that items may fall out while opening doors causing injury to personnel.**	
			e. Inventory wheel chocks and inspect wheel chock stowage compartment for damage and loose or missing hardware. f. Check DIRECT TANK FILL valve for damage and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

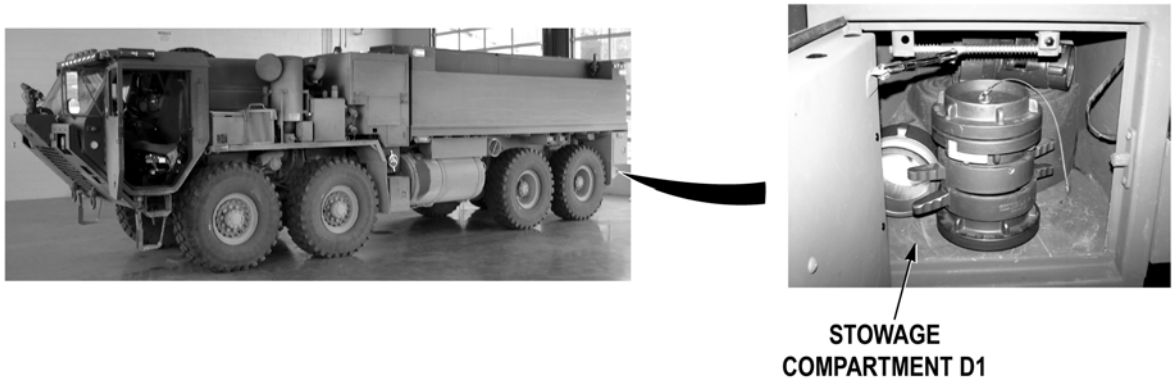
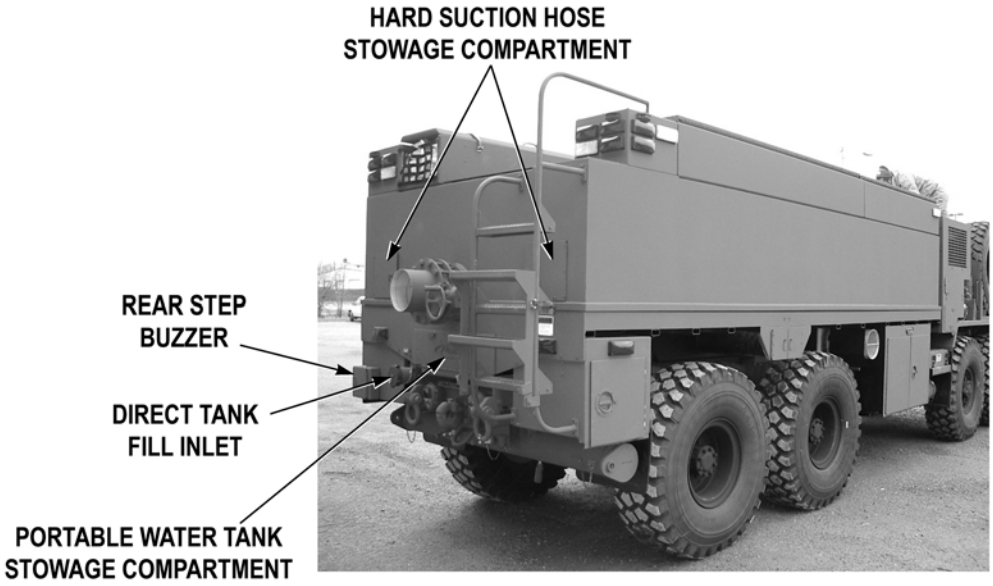
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
				
			g. Check if stowage compartment door D1 operates and is free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.) h. Check if stowage compartment D1 striplight operates. i. Inventory and inspect all COEI and BII items that have been used in mission for damage, missing gaskets, and proper operation (WP 0039).	

Table 1. Preventive Maintenance Checks and Services. (Continued)

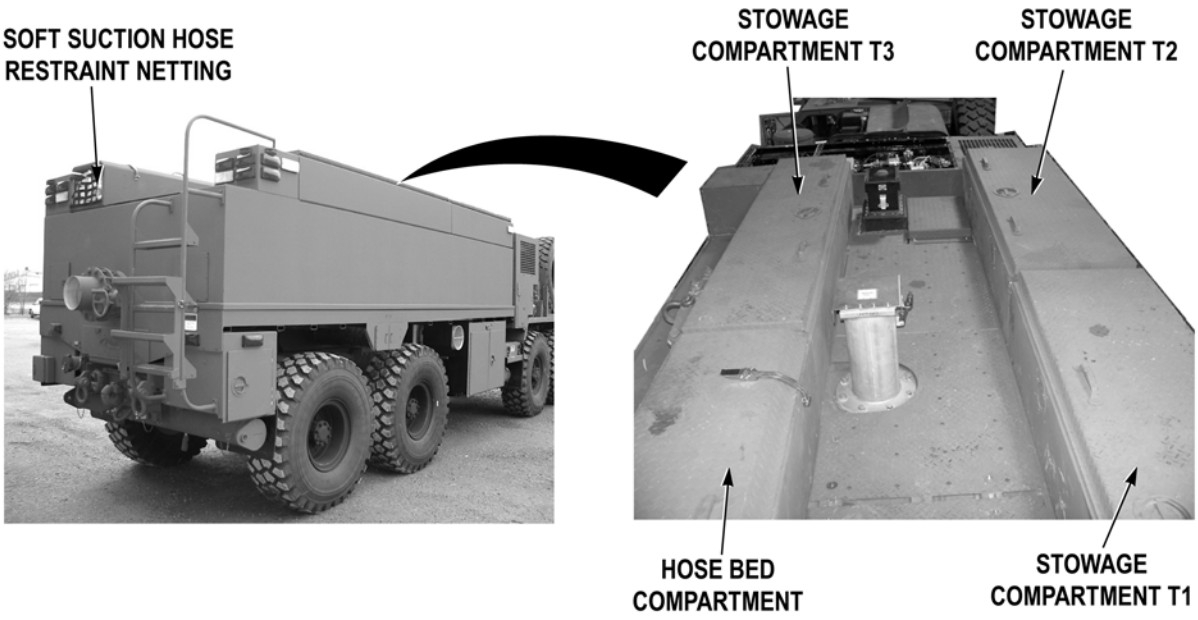
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
4	A	Rear Body		



			a. Check if REAR STEP BUZZER operates and compartment is free from damage and loose or missing hardware. Check if audible warning buzzer and indicator operate inside personnel cab. b. Check if hard suction hose stowage compartment doors operate and are free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.) c. Check if hard suction hoses and connections are free from damage and obstructions. d. Check if hard suction hose gaskets are present and free from excessive wear and damage. e. Check if portable water tank compartment door operates and is free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.) f. Check if DIRECT TANK FILL inlet, cap, and strainer are free from damage and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
5	A	Vehicle Body Top		



WARNING

Compartment doors that swing up are heavy. Ensure to have a firm grip when opening. Failure to comply may result in injury to personnel.

			a. Check if hose bed compartment door operates and is free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.) b. Check if hose restraint netting is free from excessive wear, tears, cuts, or burns. c. Check if stowage compartment doors T1, T2, and T3 operate and are free from damage, debris, and loose or missing hardware, (Lubricate if required, see Table 2.) d. Check if stowage compartment T1, T2, and T3 striplights operate. e. Inventory and inspect all COEI and BII items that have been used in mission for damage, missing gaskets, and proper operation (WP 0039).	

Table 1. Preventive Maintenance Checks and Services. (Continued)

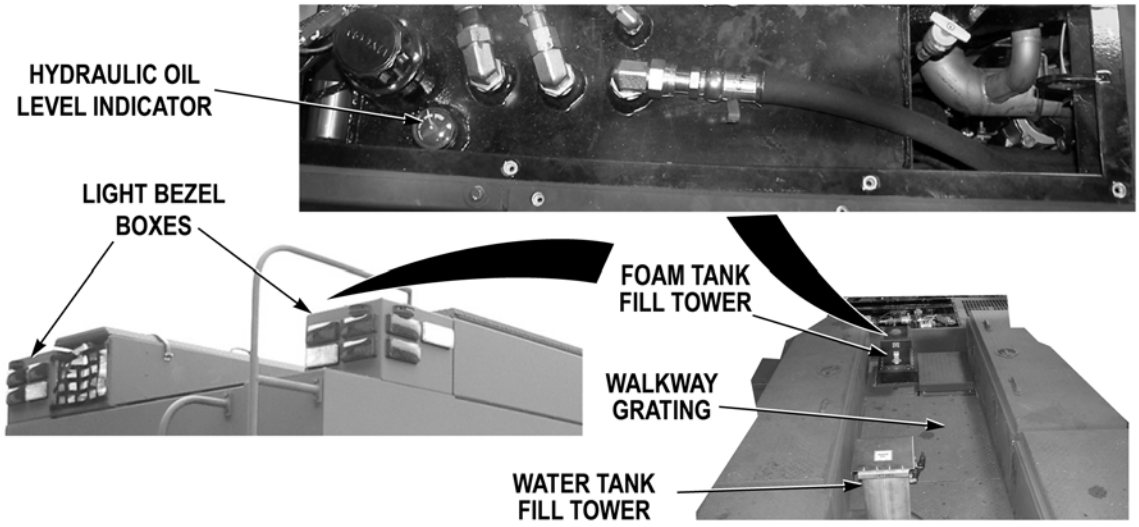
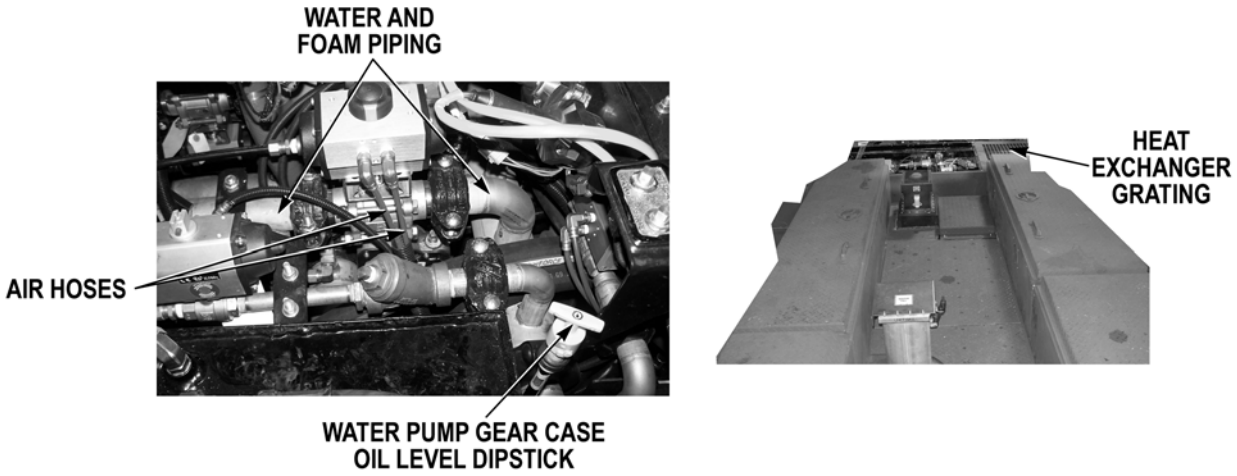
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
				
			f. Check if WATER TANK fill tower and cover operate and are free from damage and loose or missing hardware. Check water tank for contamination or debris. (Lubricate if required, refer to Table 2.) g. Check if FOAM TANK fill tower and cover operate and are free from damage and loose or missing hardware, Check foam tank for contamination or debris. (Lubricate if required, refer to Table 2.) h. Check walkway grating for damage or loose or missing hardware. i. Check if warning light bezel boxes are free from damage and loose or missing hardware. j. Check hydraulic oil reservoir oil level. If arrow is in green section, hydraulic oil level is ok. (Fill if required, refer to Table 2.)	If hydraulic oil level is low. If hydraulic oil appears milky or foaming.

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
6	A	Vehicle Body Top Pump House		



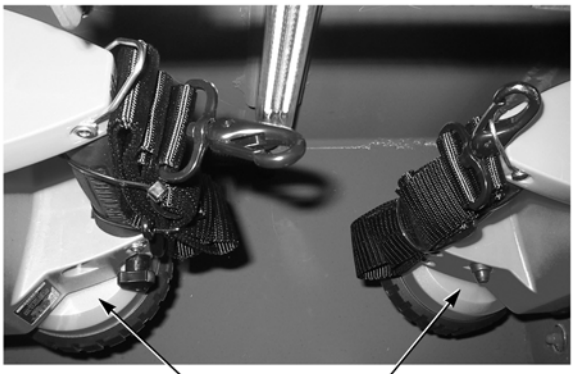
NOTE

Water pump gear case oil level may be checked either hot or cold.

			a. Check if water piping, foam piping, and air hoses are free from leaks, kinks, damage, and loose or missing fittings.	
			b. Check water pump gear case oil level.	If water pump gear case oil level is low.
			c. Check if heat exchanger grating is free from blockage and debris.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
7	A	Passenger Side Body		



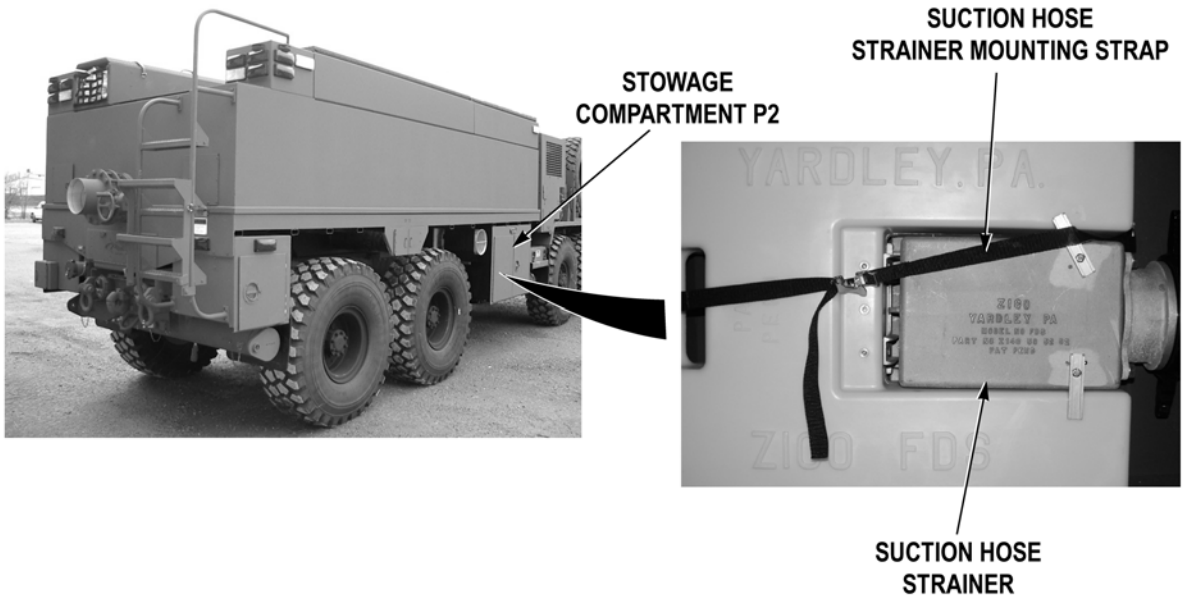
WARNING

- **Items in compartments may have shifted or come loose during operations. Use caution and be aware that items may fall out while opening doors, causing injury to personnel.**
- **While parked on side slopes, items inside compartments may fall out. Use caution and be aware that items may fall out while opening doors causing injury to personnel.**

			a. Check if stowage compartment door P1 operates and is free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.) b. Check if stowage compartment P1 striplight operates. c. Check if streamlights and chargers operate and are free from damage. Check streamlight chargers for loose or missing hardware and loose wire connections. d. Inventory SCBA tanks and check if SCBA stowage compartments are free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.)	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:



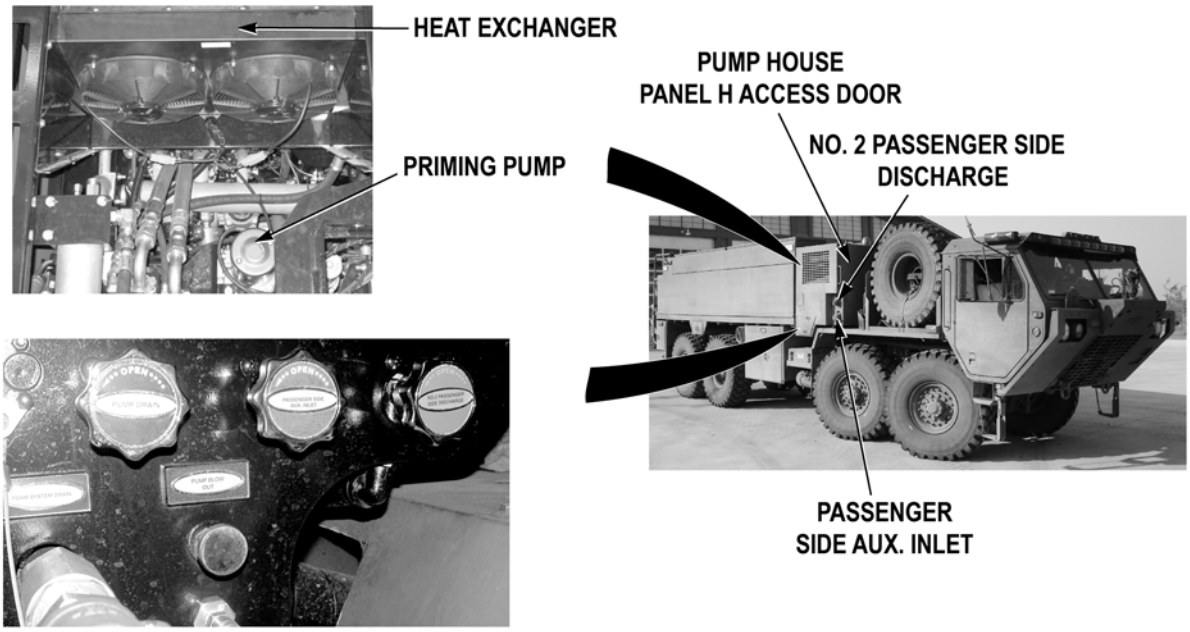
WARNING

- **Items in compartments may have shifted or come loose during operations. Use caution and be aware that items may fall out while opening doors, causing injury to personnel.**
- **While parked on side slopes, items inside compartments may fall out. Use caution and be aware that items may fall out while opening doors causing injury to personnel.**

		e. Check if stowage compartment door P2 operates and is free from damage, debris, and loose or missing hardware. (Lubricate if required, see Table 2.) f. Check if stowage compartment P2 striplight operates. g. Check if suction hose strainer mounting strap is free from excessive wear and/or damage. h. Check if suction hose strainer is free from damage and obstructions.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
8	A	Passenger Side Pump House		



			a. Check if pump house access panels are free from damage and loose or missing hardware. b. Open pump house panel H access door. c. Check heat exchanger assembly for damage and loose or missing hardware. d. Check if priming pump is free from damage and loose or missing hardware. e. Check if NO. 2 PASSENGER SIDE DISCHARGE and PASSENGER SIDE AUX. INLET and pump drain valves operate and are free from damage and loose or missing hardware. f. Check if NO. 2 PASSENGER SIDE DISCHARGE, and PASSENGER SIDE AUX. INLET caps operate properly and are free from damage. Check gaskets for tears, rips, and excessive wear. g. Check PASSENGER SIDE AUX. INLET strainer screen for damage, debris, and obstructions.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

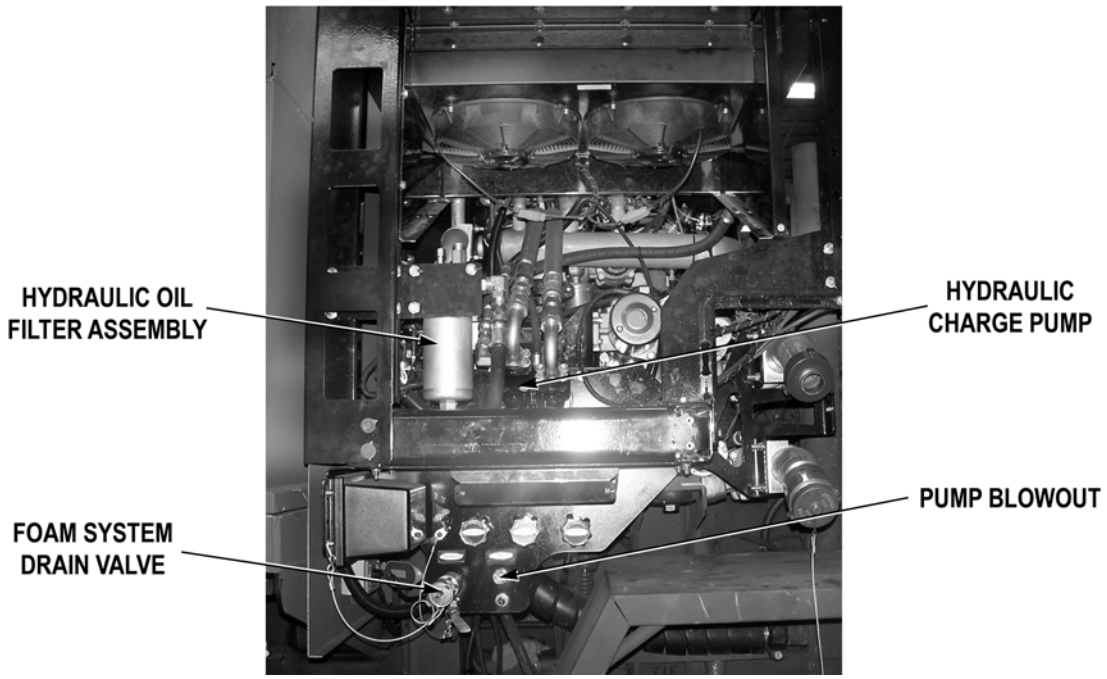
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
				
			h. Check if foam system drain valve and pump blow out operate and are free from loose or missing hardware.	
			i. Check if water piping, foam piping, hydraulic hoses, and air hoses are free from leaks, kinks, damage and loose or missing fittings.	If water piping, foam piping, hydraulic hoses are damaged or have loose or missing hardware.
			j. Check if wires are free from damage and loose connections.	If wires are damaged.
			k. Check if hydraulic oil filter assembly is free from leaks, damage, and loose or missing hardware.	
			l. Check if hydraulic charge pump is free from leaks, damage, and loose or missing hardware.	
			m. Check valves, valve motors, and other equipment for loose wire connections, damage, and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

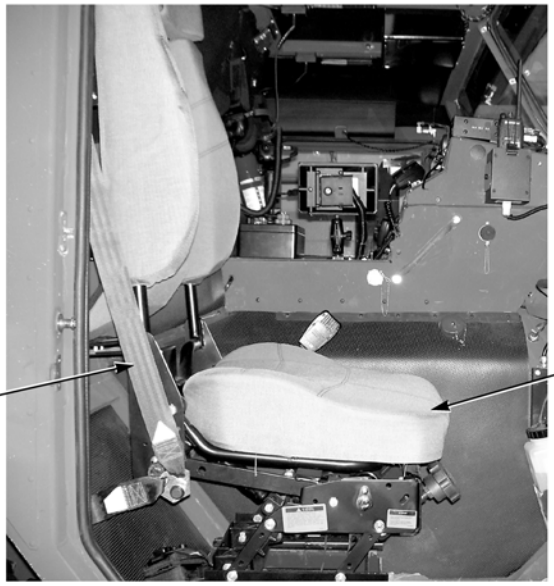
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
9	A	Passenger Side Personnel Cab		
			a. Check if SCBA seat if free from damage and loose or missing hardware. b. Check if SCBA breakaway brackets are free from damage and loose or missing fittings. c. Check if seatbelt is free from rips, tears, and excessive wear. Check if seatbelt is free from damage and loose or missing hardware. d. Check that seatbelt and latch operate properly. e. Inventory and inspect personnel cab COEI and BII (WP 0039).	

Table 1. Preventive Maintenance Checks and Services. (Continued)

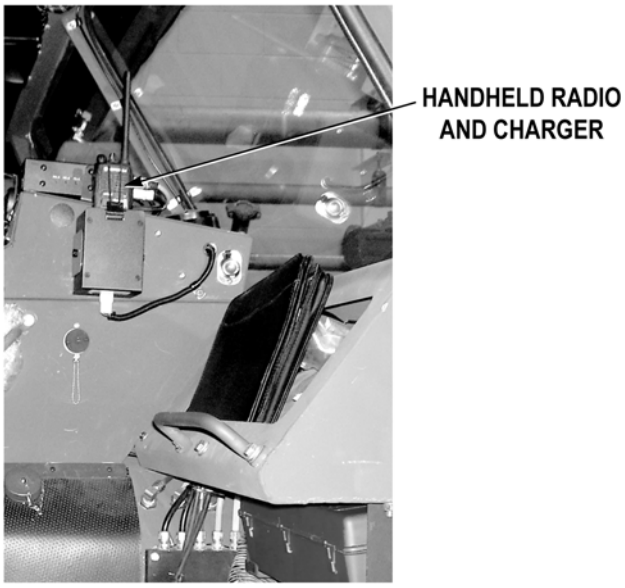
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
				
			f. Check if passenger side handheld radio operates and is free from damage. g. Check if handheld radio base is operating and free from damage and loose or missing hardware. h. Check if battery charger wires and connections are free from damage and securely connected.	If both handheld radios do not operate properly.

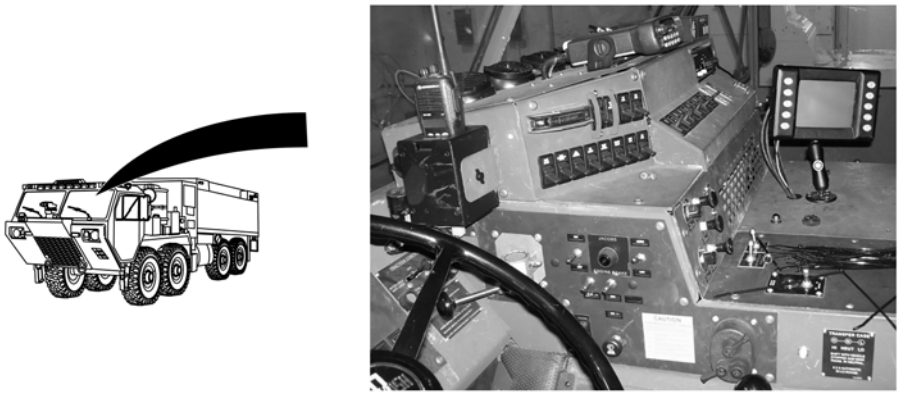
Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
10	A	Front Cab Body		

			a. Check bumper turret and air lines for leaks, kinks, damage, obstructions and loose or missing fittings. b. Check if windshield deluge nozzles and hoses are free from leaks, kinks, and damage. c. Check if siren is free from damage and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
11	A	Personnel Cab Driver Side		
			a. Check if cab instrument panel assembly is free from damage and loose or missing hardware. b. Check if cab instrument panel and pump control panel backlighting operates. c. Check cab instrument and pump control panel switches for proper operation and visible damage. Check if emergency warning lights are working on exterior of vehicle.	If all control panel switches are inoperable.
12	A	Vehicle Bottom		
			a. Check if under truck nozzles and hoses are free from leaks, damage, obstructions, and loose or missing hardware.	



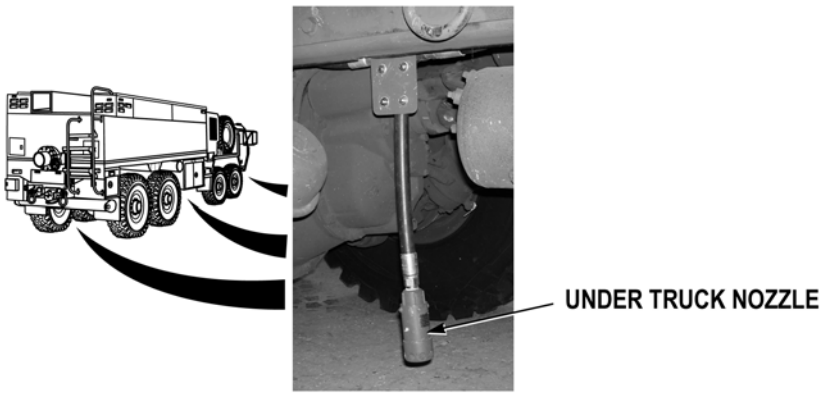


Table 1. Preventive Maintenance Checks and Services. (Continued)

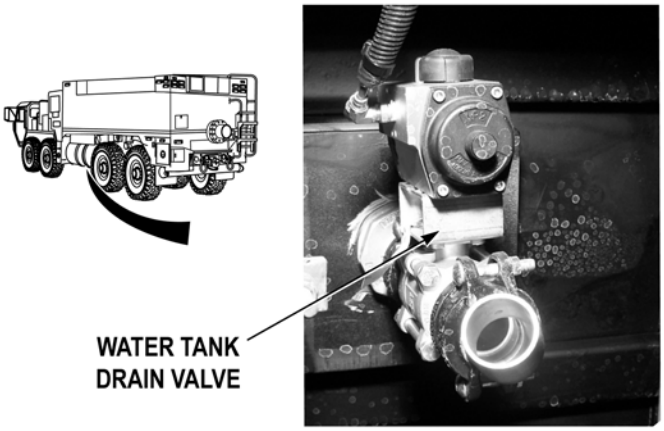
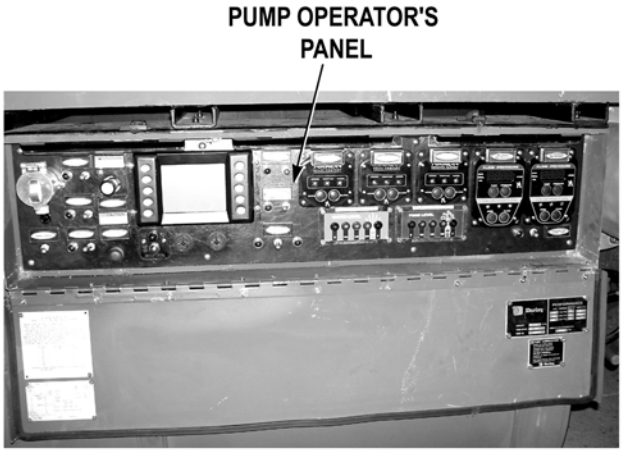
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
				
			⚠ CAUTION **Ensure personnel are clear from under vehicle before operating tank drain. Failure to comply could cause injury to personnel.**	
			b. Check if water tank drain valve operates and is free from leaks, damage, obstructions, and loose or missing hardware.	
			c. Check if hydraulic oil reservoir drain valve is free from leaks, damage and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
13	D	Pump Operator's Panel		



a. Check if pump operator's panel enclosure is free from damage and loose or missing hardware.

b. Check if pump operator's panel, PANEL LIGHTS operate.

c. Check pump operator's panel switches for proper operation and visible damage.

d. Check pressure governor for proper operation and visible damage.

e. Check all indicators for operation and visible damage.

f. Check if all segments of water tank and foam tank level gauges illuminate when tanks are full.

Table 1. Preventive Maintenance Checks and Services. (Continued)

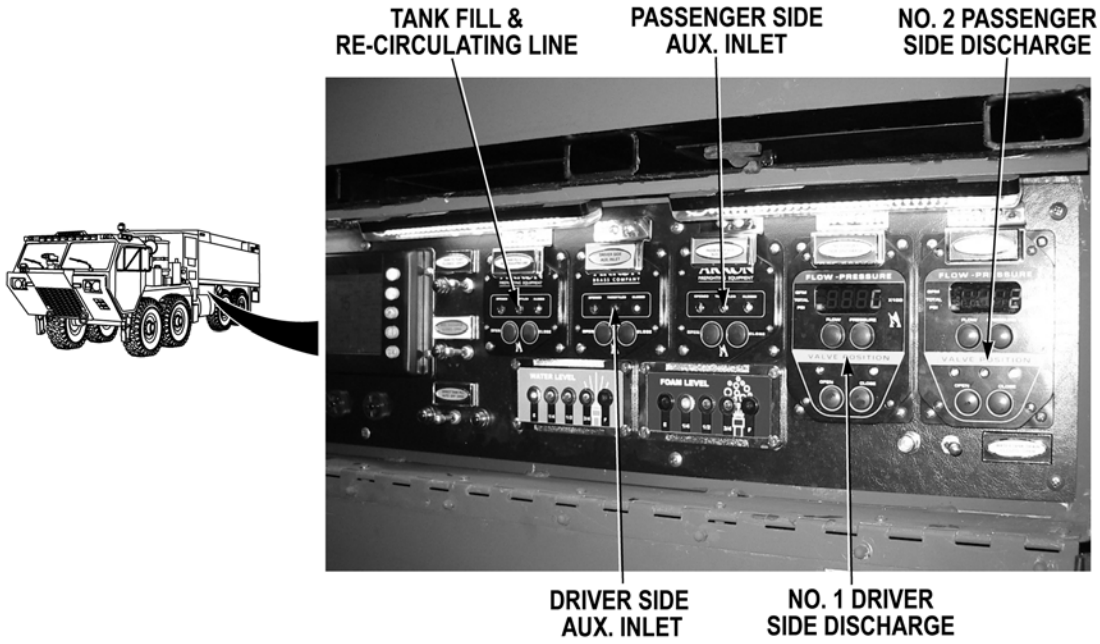
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
				
			g. Check if No. 1 Driver Side DISCHARGE, DRIVER SIDE AUX. INLET, TANK FILL & RE-CIRCULATING LINE, NO. 2 PASSENGER SIDE DISCHARGE, and PASSENGER SIDE AUX. INLET valve controls operate properly and are free from damage.	If valve control is inoperable or damaged.

Table 1. Preventive Maintenance Checks and Services. (Continued)

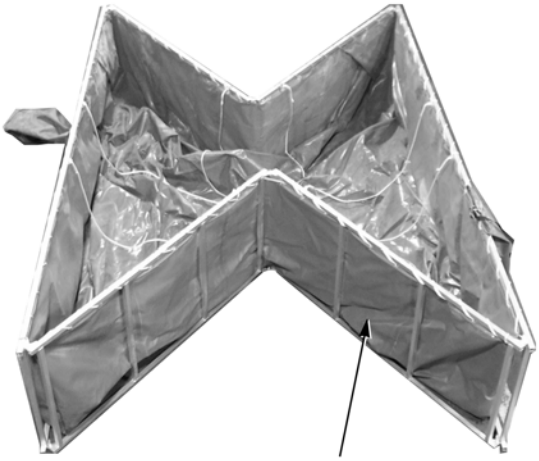
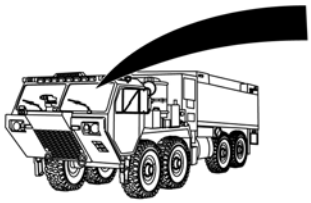
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
14	D	Rear Body		
				
			a. Check if portable water tank frame is free from damage and loose or missing hardware. b. Check if portable water tank is free from leaks and tears.	
	D		c. Check soft discharge hoses for wear, tears, cuts or burns. Check fittings and threads for visible damage.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
15	D	Personnel Cab Driver Side		
			a. Check if cab instrument panel and pump control panel backlighting operates. b. Check cab instrument and pump control panel switches for proper operation and visible damage. Check if emergency warning lights are working on exterior of vehicle. c. Check pressure governor for proper operation and visible damage (WP 0016).	If all control panel switches are inoperable.
			d. Check if all segments of water tank and foam tank level gauges illuminate when tanks are full (WP 0021).	



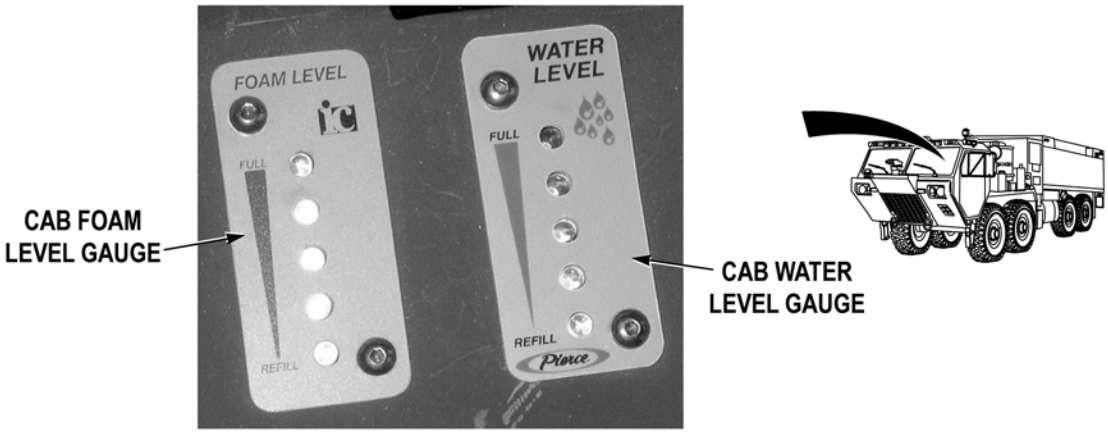
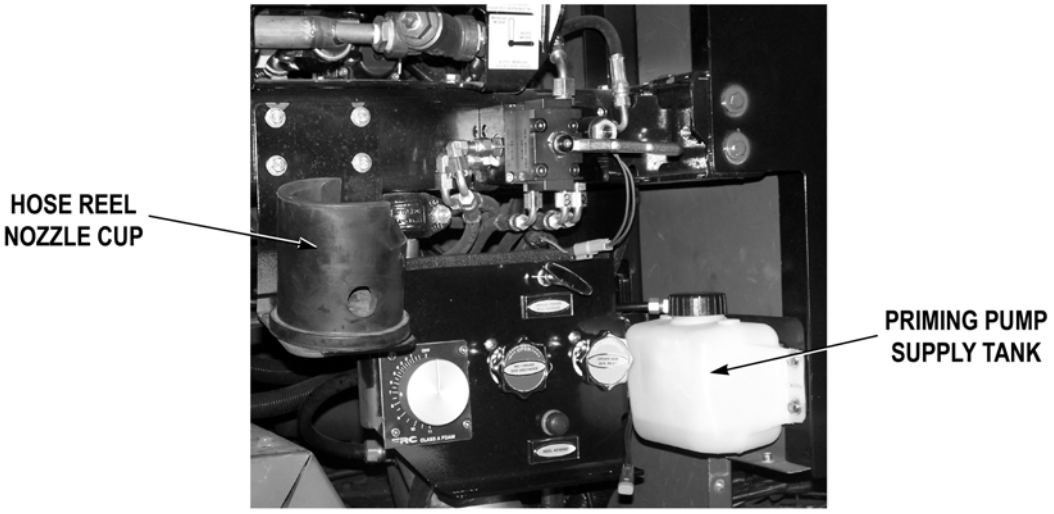


Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
16	M	Driver Side Pump House		



			a. Inspect hose reel nozzle cup for damage or loose or missing hardware. b. Refill priming pump supply tank with water. Refer to (WP 0034).	
17	M	Driver Side Body		

			a. Check if manual dump valve operates and is free from damage and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

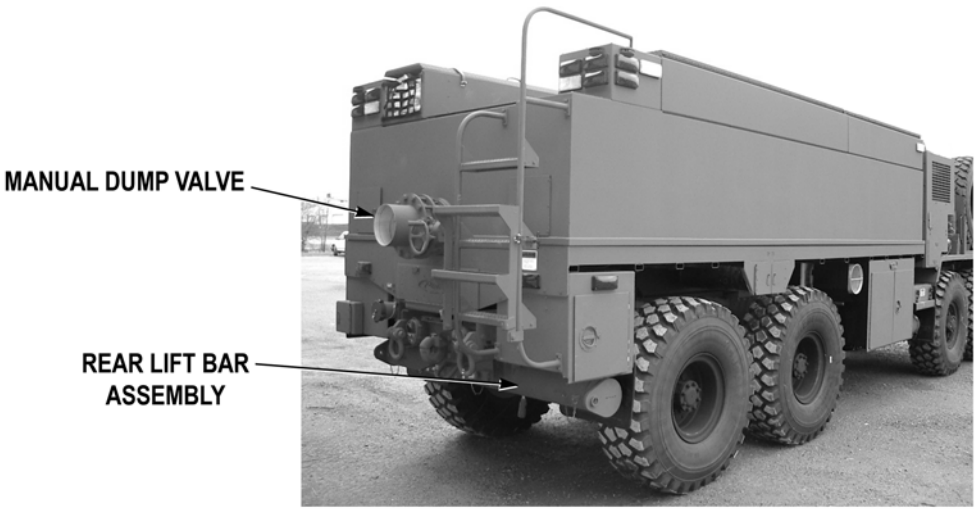
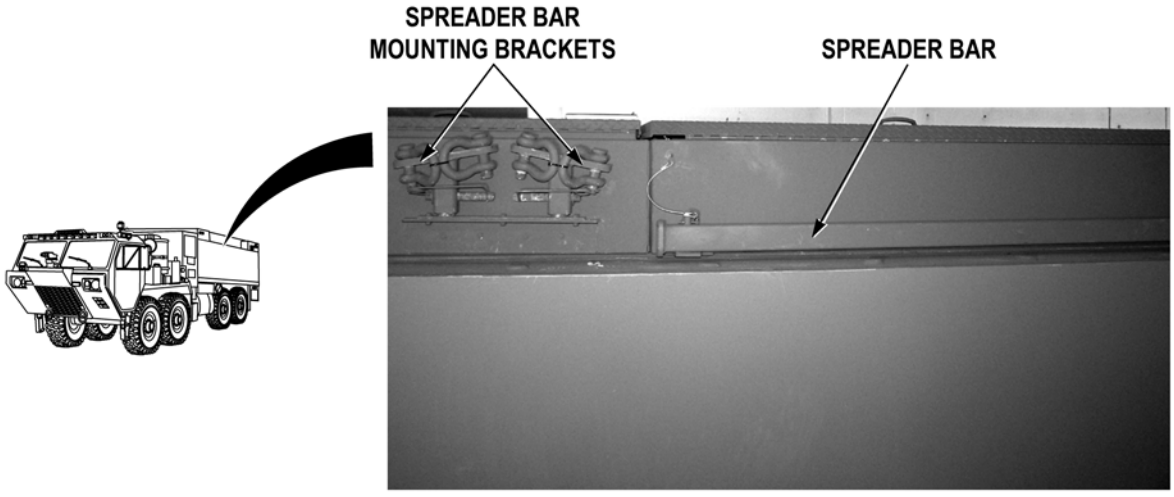
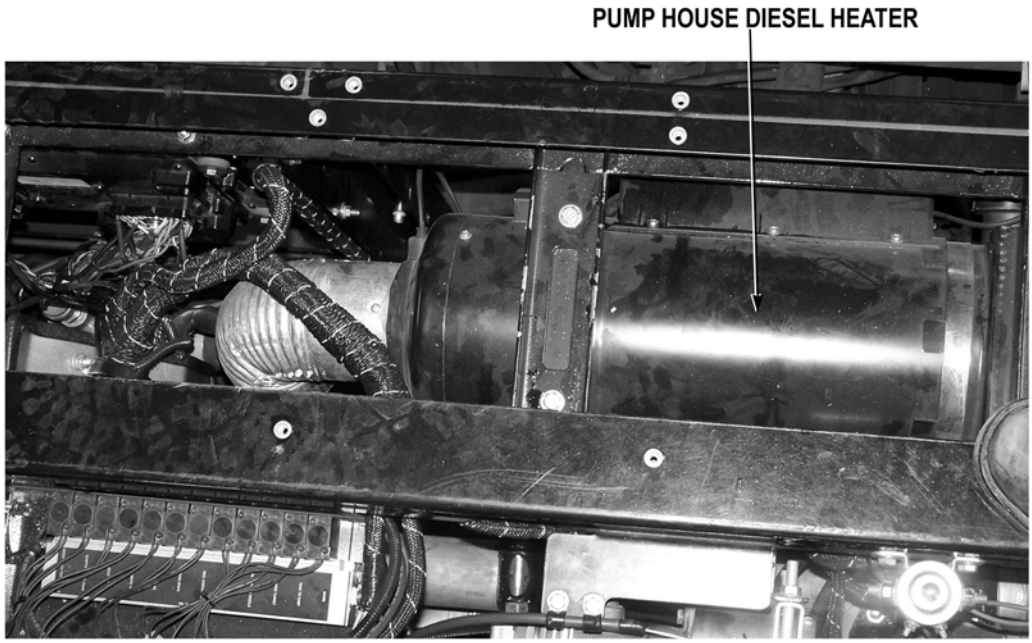
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
18	M	Rear Body		
				
			a. Check if rear body is free from dents and scratches. Paint any exposed surfaces as required. Refer to TB 43-0242. b. Check if manual dump valve operates and is free from damage and loose or missing hardware. c. Check if rear lift bar is free from damage and loose or missing hardware.	
19	M	Vehicle Body Top		
				
			a. Check if spreader bar, shackle assemblies, and mounting brackets are free from damage and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

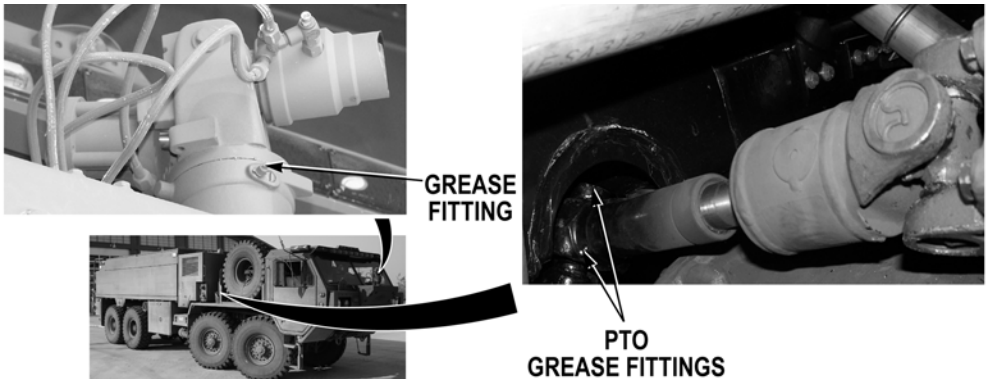
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
20	M	Vehicle Body Pump House Top		



			a. Open pump house panel K access door (WP 0341). b. Check if diesel heater is free from damage and loose or missing hardware.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

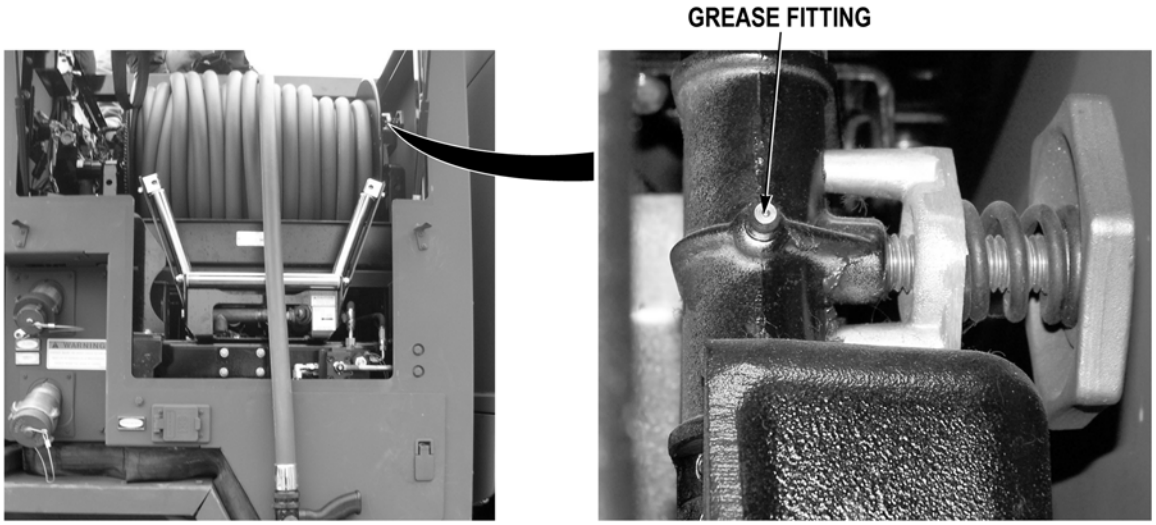
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
21	M	Passenger Side Body		



WARNING

Ensure batteries are disconnected, PUMP PTO switch is in off position, and PTO shaft is not spinning, prior to performing PMCS on PTO shaft. Failure to comply may cause serious injury or death to personnel.

			a. Grease pump PTO grease fittings. b. Grease bumper turret grease fitting.	



			c. Grease hose reel grease fitting.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

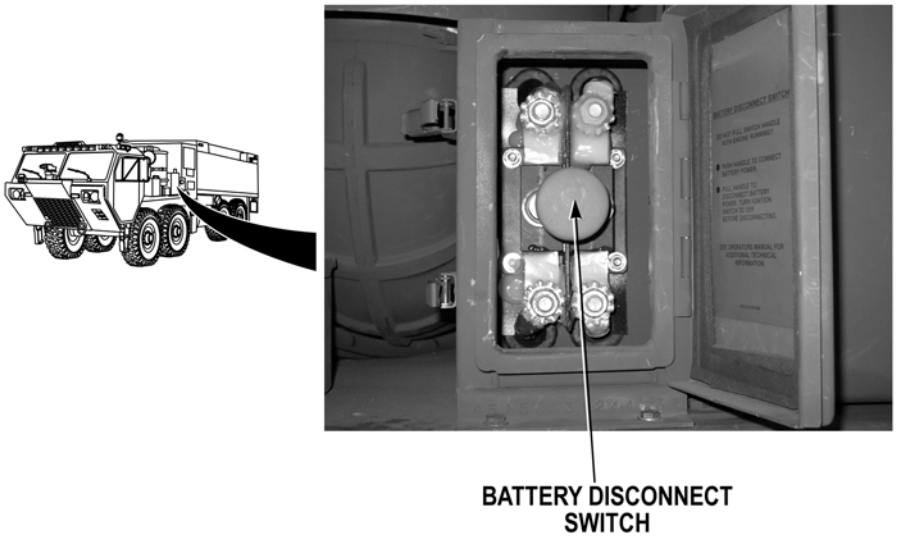
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
22	M	Driver Side Body	d. Check if manual dump valve operates and is free from damage and loose or missing hardware.	
				
			a. Inspect battery disconnect switch for damage and loose connections. b. Check if driver side body is free from dents and scratches. Paint any exposed surfaces as required.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

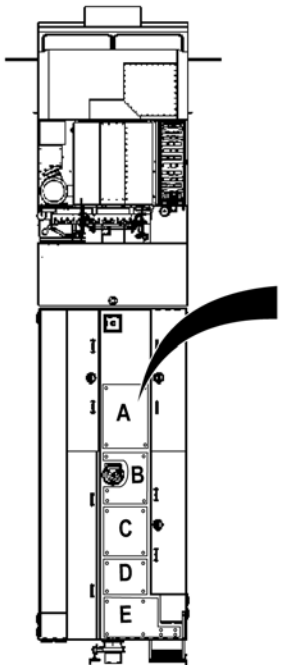
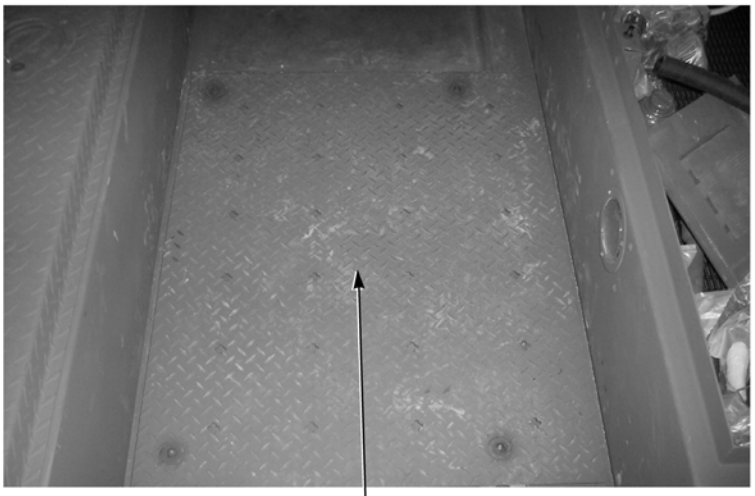
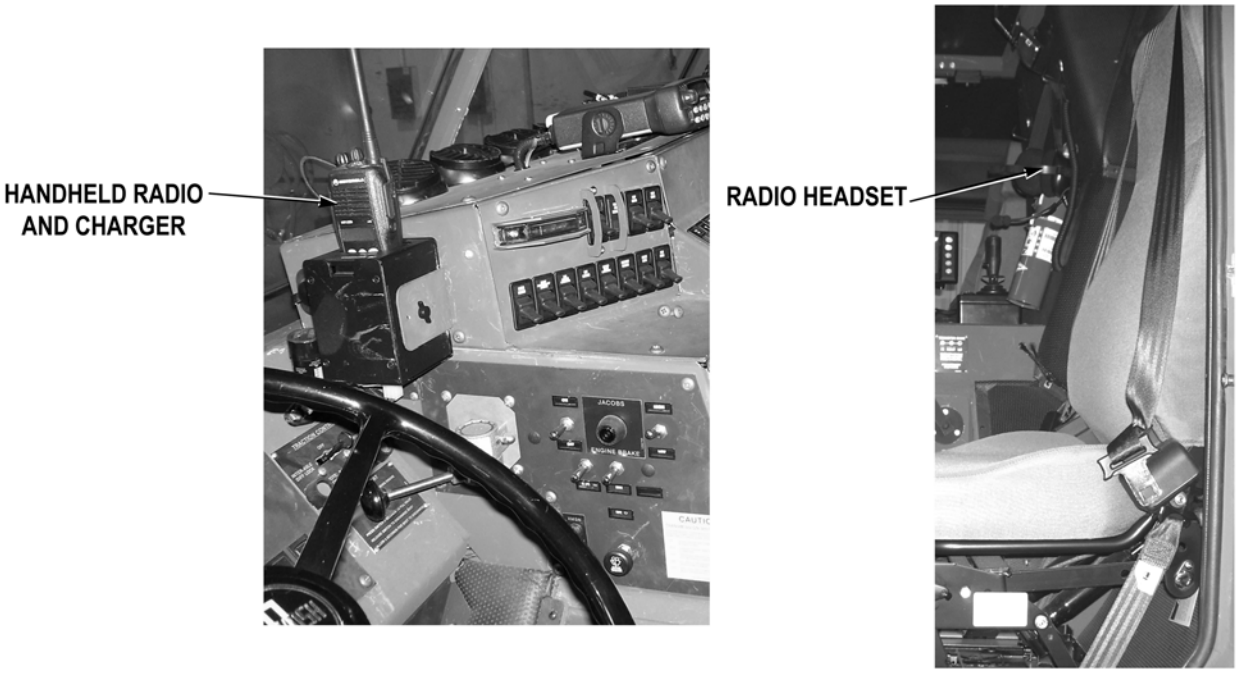
Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
23	M	Rear Body		
			a. Check rear step ladder for damage and loose or missing hardware. (Lubricate if required, see Table 2).	
24	M	Vehicle Body Top		
			 	
			a. Check if walkway grating is free from damage and loose or missing hardware. b. Check if vehicle body top and pump house top are free from dents and scratches. Paint any exposed surfaces as required. Refer to TB 43-0242.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
25	M	Passenger Side Body		
			a. Check if passenger side body is free from dents and scratches. Paint any exposed surfaces as required. Refer to TB 43-0242.	

Table 1. Preventive Maintenance Checks and Services. (Continued)

Item No.	Interval	Item To Inspect Or Service	Procedure	Not Fully Mission Capable if:
26	M	Personnel Cab Driver Side		



			a. Check if driver side handheld radio operates and is free from damage. b. Check if handheld radio base is operating and free from damage and loose or missing hardware. c. Check if battery charger wires and connections are free from damage and securely connected. d. Check if radio headsets operate at all headset jacks.	

LUBRICATION INTRODUCTION

1. **Intervals (on-condition or hardtime) and the related man-hour times are based on normal operation.**

   The man-hour time specified is the time needed to do all the services prescribed for a particular interval. Change the hardtime interval if lubricants are contaminated or if operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The calendar interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hardtime intervals must be applied during the warranty period.

WARNING

Solvent cleaning compound MIL-PRF-680 Type II and III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Use respirator as needed. Accidental ingestion can cause irritation of digestive tract and respiratory tract, may cause lung and central nervous system damage. Can be fatal if swallowed. Inhalation of high/massive concentrations can cause coma or be fatal. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Keep away from open flames and other sources of ignition. Failure to follow this warning may result in injury or death to personnel.

- **The flashpoint for Type II solvent cleaning compound is 141-198°F (61-92°C) and Type III is 200-241°F (93-116°C).**
- **Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.**
- **Fire extinguishers should be placed nearby when using solvent cleaning compound. Failure to follow this warning may result in injury or death.**
- **Cloths or rags saturated with solvent cleaning compound must be disposed of IAW authorized facilities' procedures. Failure to follow this warning may result in injury.**
- **Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particle may cause injury.**

2. **Cleaning fittings before lubrication.**

   Clean parts with solvent cleaning compound (SD P-D-680) or equivalent. Dry before lubricating.

3. **Lubrication after high-pressure washing.**

   After a thorough washing, lubricate all grease fittings and oil can points outside and underneath vehicle.

WARNING

Personnel hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB or greater. Wear approved hearing protection devices when working in high noise level areas. Hearing loss occurs gradually, but becomes permanent over time.

NOTE

These lubrication instructions are mandatory.

Table 2. Lubricating Chart.

Item No.	Interval	Item To Be Lubricated	Procedure	Type	Quantity
1	3 months 6 months	WATER PUMP Gear Case	Check gear case oil level. Replace gear case oil.	75W/90:Synthetic 75W/90:Synthetic	1 qt. (0.9 l)
2	12 months	CAB AND BODY	Lubricate doors, side panels, hood hinges, locks, latches, and other pivot points.	Cleaner, Lubricant A (MIL-L-63460)	As required
3	As required	Priming Pump Lubricant Supply Tank	Fill priming pump lubricant supply tank	Water	1.7 qt. (1.6 l)
4	12 months	PTO Driven Hydrostatic Pump	Replace hydraulic oil in reservoir.	ISO 32	11 gal. (41.6 l)
5	6 months	Pump PTO	Grease Fittings (2)	GAA (MIL-G-10924) Grease Automotive and Artillery	As required
6	6 months	Hose Reel	Grease Fitting	GAA (MIL-G-10924) Grease Automotive and Artillery	As required
7	12 months	Hydraulic Oil Filter	Replace	Filter Element Model 02400010 BHHC	1
8	6 months	Bumper Turret	Grease Fitting	GAA (MIL-G-10924) Grease Automotive and Artillery	As required

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Strainer Body and Tee Assembly Installation	WP 0326-4
Strainer Body and Tee Assembly Removal	WP 0326-3
Strainer Installation	WP 0326-2
Strainer Removal	WP 0326-1
Windshield Deluge Motor	
Installation	WP 0276-3
Removal	WP 0276-1
Windshield Deluge Nozzle(s)	
Installation	WP 0368-2
Removal	WP 0368-1
Windshield Deluge Operation	
Starting	WP 0025-1
Stopping	WP 0025-1
Windshield Deluge Pump House Strainer Screen	
Installation	WP 0367-2
Removal	WP 0367-1
Windshield Deluge Shutoff Valve and Strainer Assembly	
Installation	WP 0386-3
Removal	WP 0386-1
Windshield Deluge System Does Not Operate Properly	WP 0083-1
Wire Harness Mounting Bracket	
Installation	WP 0369-2
Removal	WP 0369-1
Wire Rope	
Installation	WP 0370-3
Removal	WP 0370-1

By order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0801103

Distribution: To be distributed in accordance with the initial distribution number (IDN) 381179, requirements for TM 9-2320-328-13&P-1.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE Date you filled out this form.
TO: *(Forward to proponent of publication or form) (Include ZIP Code)* AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630	FROM: *(Activity and location) (Include ZIP Code)* Your mailing address	

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	Title
TM 9-2320-328-13&P-1	30 Apr 08	Operator and Field Maintenance Manual and RPSTL for HEWATT Model M1158

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).

SAMPLE

**Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	Signature
Your Name		*Your Signature*

DA FORM 2028, FEB 74 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED. USAPPC V3.00

TO: (Forward direct to addressee listed in publication)	FROM: (Activity and location) (Include ZIP Code)	DATE
AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630	Your address	Date you filled out this form

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM 9-2320-328-13&P-1	30 APR 08	Operator and Field Maintenance Manual and RPST for HEWATT Model M1158

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

SAMPLE

PART III – REMARKS **(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)**

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name		Your Signature

USAPPC V3.00

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TO: (Forward to proponent of publication or form)(Include ZIP Code) AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630	FROM: (Activity and location) (Include ZIP Code)	

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 9-2330-328-13&P-1	30 Apr 08	Operator and Field Maintenance Manual and RPSTL for HEWATT Model M1158

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).

**Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 2028, FEB 74 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED. USAPPC V3.00

TO: (Forward direct to addressee listed in publication) AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630	FROM: (Activity and location) (Include ZIP Code)	DATE

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM 9-2320-328-13&P-1	08 Apr 08	Operator and Field Maintenance Manual and RPSTL for HEWATT Model M1158

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE
1 Centimeter=10 Millimeters=0.01 Meters=0.3937 Inches
1 Meter=100 Centimeters=1000 Millimeters=39.37 Inches
1 Kilometer=1000 Meters=0.621 Miles

WEIGHTS
1 Gram=0.001 Kilograms=1000 Milligrams=0.035 Ounces
1 Kilogram=1000 Grams=2.2 Lb
1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

LIQUID MEASURE
1 Milliliter=0.001 Liters=0.0338 Fluid Ounces
1 Liter=1000 Milliliters=33.82 Fluid Ounces

SQUARE MEASURE
1 Sq Centimeter=100 Sq Millimeters=0.155 Sq Inches
1 Sq Meter=10,000 Sq Centimeters=10.76 Sq Feet
1 Sq Kilometer=1,000,000 Sq Meters=0.386 Sq Miles

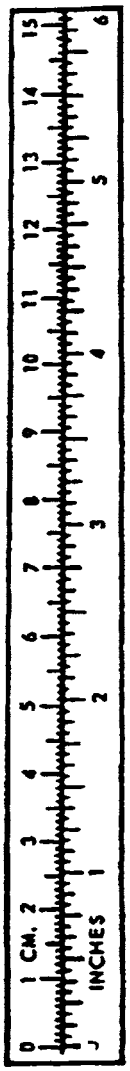
CUBIC MEASURE
1 Cu Centimeter=1000 Cu Millimeters=0.06 Cu Inches
1 Cu Meter=1,000,000 Cu Centimeters=35.31 Cu Feet

TEMPERATURE
5/9 (°F − 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 C° + 32 = F°

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds/Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Km per Liter	Miles per Gallon	2.354
Km per Hour	Miles per Hour	0.621



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